UNIVERSITY OF MALAYA

UMR Bulletin

University of Malaya Research

Volume 3 2013

Highlights

EXPO Highlights
University of Malaya Researchers' Conference 2013
Research Highlights
Centres of Excellence

UNIVERSITY OF MALAYA

UMR University of Malaya Research

The UMR Bulletin Team

From The Editor

*It has been a very busy but fulfilling year for us. Being the **Top Research University** is a testimony of the concerted effort of everyone and the strategies put in place by the top management team. Nevertheless, we must not rest on our laurels but continue to strive forward and keep improving.*

This issue highlights the outcome of the Expos which we have participated in the past 3 months and the research activities of the Research Clusters and Centres, UMCIC, USP and PPP. Any suggestion to improve our UMR Bulletin is most welcome as we aim to serve the UM community better. I thank all the contributors of this issue.

Wishing all of you,"A More Productive New Year 2014".

Thong Kwai Lin

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Preface

DEPUTY VICE-CHANCELLOR (Research & Innovation)

This is my fourth preface in the UM Research Bulletin. It has been an eventful 18 months and UM research is going from strength to strength. Several new developments have taken place since my last preface.

In October 2013, the Photonics Research Centre and the Institute of Ocean and Earth Sciences were audited for HICoE status. Preliminary results appear to be favourable. In November 2013, the results of the Research University Audit were revealed. Officially, UM is now Malaysia's BEST Research University. Good news but the audit has also revealed several weaknesses in our research ecosystem.

More new strategies on increasing citations, commercialisation, improving our research funding, creating more innovations, improving our research branding etc have been drawn up and accompanying action plans are now being carried out. Our new Research Grant Management System (RGMS) and Research Project Management System (RPMS) are now being enhanced in phases. We are also upgrading and enhancing the UM Research website to provide better research information.

We are strengthening our HICoE and Potential HICoEs and readying other potential research centres so that they will be better placed to apply for HICoE. High-performing research centres will be given extra help.

More strategies in the next bulletin.

Awg Bulgiba Awg Mahmud

DIRECTOR OF IPPP

It is now almost the end of the year and time to reflect on what we have done for the past one year and what we should be doing to make next year more successful year for us. There have been many challenges for us this year, particularly, when we had to several audits; the most important for IPPP being the Research University (RU) audit. I am happy to report that we went through this audit without any casualties.

The Research University audit for UM was carried out in April and the results of the audit was just announced in November of this year. I am also happy to report that UM did well in the audit and we came first amongst all the research universities in Malaysia. I would like to take this opportunity to thank the campus community for all their cooperation and effort in making this achievement for UM a reality.

In November, UM researchers participated in several expos, namely BioMalaysia, PECIPTA and SIIF2013 in Seoul, Korea. Again, our researchers did UM proud by winning awards in these expos. We had 100% successes in PECIPTA and SIIF2013, where all of the research products we exhibited won medals and awards. Congratulations to all our innovators.

It is also in the month of November that UM has a changed in leadership. Tan Sri Ghauth Jasmon finished his term as Vice-Chancellor of UM and Datuk Dr. Mohd Amin Jaluludin took over the VCship of UM. We would like to record our heartiest gratitude to Tan Sri Ghauth for all his support and encouragement to IPPP to ensure that our researchers are able to produce their best for UM. His relentless effort to make research is a priority for UM has managed to put UM on the research map of the world. We would also like to congratulate Datuk Dr. Mohd Amin for his appointment and welcome him back into the UM. We are confident that he will continue to support us in our quest to uphold UM' s tradition for excellence.

As 2013 draws to a close and 2014 begin to open its door, we have to ready ourselves for the uncertain challenges ahead. We look forward to our new RU budget which will enable us to go forward with the research programs and projects that we have planned. The Grand Challenges research programs that have been announced and brainstormed over will hopefully take place in the New Year. Our research clusters will also take up a new look in the new year, going from 8 clusters in 6 clusters that are more trans-disciplinary in nature. The success of our plans and university depends on us and how well prepared we are to meet the challenges that lie ahead. I am sure that we are ready take up these challenges and put our efforts together to make UM excellent. Thank you all for a good 2013 and I wish everyone a happy and successful 2014.

Noorsaadah Abd. Rahman

UMRC 2013 | 19- 20 NOV 2013 | RMIC

UMRC 2013 Opening Ceremony

Keynote session by Prof Dato' Dr. Mohd Amin Jalaludin

Welcoming Speech by Prof. Dr. Awg Bulgiba Bin Awg Mahmud

The University of Malaya Researchers' Conference was held at the Institute of Research Management and Monitoring. Five grand challenges were discoursed from a multi-disciplinary point of view; featuring panellists from the academia and the industry. A total of 288 participants attended the conference.

A school programme was organised to run concurrently with 112 participants from 4 schools. Activities for the students included 'Meet the Sports Icon' and 'Hollywood Science'.

Panelist-Dr. Ahmad Ibrahimm, CEO Academy of Sciences Malaysia

Panelist-YM Raja Dato' Abd Aziz Raja Muda Musa- Chairaman, federation of Malaysian Manufacturers, (FMM)

Panelist-Mr. Philip Koh Tong Ngee- Senior Partner- Mah-Kamariah & Philip Koh

Panelist-YBHG. Dato' Shahril Mokhtar- GM- Sykt Prasarana Negara Bhd


UMRC 2013 Poster Competition



UM Products and Research Centre Exhibition


MyIpo mobile clinic was available to give exposure to the researchers about Intellectual Property and patent



"Meet the Sports Icon"-school programme which was organised concurrently.

PETROSAINS SCIENCE FESTIVAL 2013 I 22-27 NOV 2013 I KLCC

MRC showcased the various types of edible and medicinal mushroom

The University of Malaya showcased its leading research related to mushrooms, from the Mushroom Research Center (MRC), at the Petrosains Science Festival 2013

MRC showcased the various types of edible and medicinal mushroom, products derived from mushroom and the diversify of mushroom available in Malaysia.

Other activities at the Petrosains Science Festival 2013

BIOMALAYSIA AND BIOECONOMY ASIA PACIFIC 2013 | 21- 23 OCTOBER 2013 | PERSADA JOHOR

Datuk Seri Mohamed Khaled Nordin officiated the opening of BioMalaysia and BioEconomy Asia Pacific 2013

UM researchers explaining their inventions to the judges

UM researchers with their medals

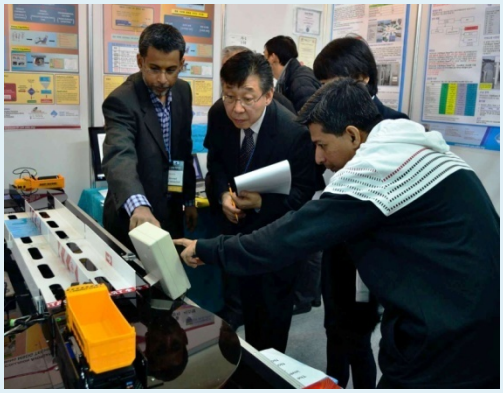
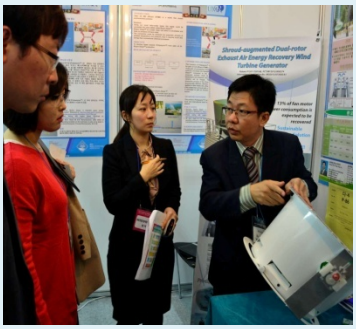
PECIPTA 2013 | 7- 9 NOV 2013 | KLCC

Datuk Seri Idris Jusoh visits the UM Booth

UM products

UM researchers with their awards

SIIF 2013 I 29 NOV- 2 DEC 2013 I SEOUL, KOREA

UM researchers explaining their inventions to the judges

Prof . Dr. Thong Kwai Lin (Director of PPP) with UM medals winners

RESULTS FROM BIOMALAYSIA AND BIOECONOMY ASIA PACIFIC 2013

RESEARCHER(S)	TITLE	AWARDS
Prof. Dato' Dr. Zainal Ariff Bin Abdul Rahman Prof. Dr. Vickneswaran A/L Mathaneswaran Mr. Alwin Kumar Rathinam Mr. Yuwaraj Kumar A/L Balakrishnan Mr. Tan Su Tung	Surgical Volumetric Biomodels Of The Human Anatomy (SVBMHA)	**Gold**
Assoc. Prof. Dr. Mohamad Suffian Mohamad Annuar Prof. Dr. Norzulaani Khalid Mr. Vilas Sulang Agas	Celflo : Aseptic Inoculation System	**Gold**
Prof. Dr. Vickneswaran A/L Mathaneswaran Prof. Dato' Dr. Zainal Ariff Bin Abdul Rahman Mr. Alwin Kumar Rathinam Mr. Yuwaraj Kumar A/L Balakrishnan Mr. Tan Su Tung Mr. Amir Hossein Mehbodniya	Medical Communication Centre (MEDCOM -OR)	**Silver**
Prof. Dr. Ramesh T.Subramaniam Prof. Dr. Abdul Kariem Arof Dr. Ramesh Kasi Ms. R.Shanti Rajantharan Mr. Ng Hon Ming Mr. Mohd Zieauddin Kufian Dr. Ezra Morris Abraham Gnanamuthu (UTAR) Dr. Chee Swee Yong (UTAR)	Bio-Economic Copolymer Electrolytes for Electrochemical Devices in Energy Industries.	**Silver**
Prof. Dr. Ramesh T.Subramaniam Prof. Dr. Abdul Kariem Arof Dr. Ramesh Kasi Ms. R. Shanti Rajantharan Mr. Ng Hon Ming Mr. Mohd Zieauddin Kufian Dr. Ezra Morris Abraham Gnanamuthu (UTAR) Dr. Vengadaesvaran Balakrishnan	Gamma Irradiated Green Polymer Electrolytes with Greater Shelf Life for Electrochemical Industrial Application	**Silver**
Dr. N. S Jayakumar Dr. Jaya Narayan Sahu (ITB, Brunei) Mr. Mubarak Mujawar Prof. Dr. Ezzat Chan Abdullah (UTM)	Sustainably Production Of Magnetic Biochar From Agriculture Waste Biomass By Using MicrowaveTechnology	**Silver**
Dr. N. S Jayakumar Dr. Jaya Narayan Sahu (ITB, Brunei) Mr. Mubarak Mujawar Prof. Dr. Ezzat Chan Abdullah (UTM)	Enhancement Of Heavy Metal Removal From Waste Water Using Magnetic Biochar Synthesized By Microwave Technology	**Silver**
Assoc. Prof. Dr. Mohamad Suffian Mohamad Annuar Prof. Dr. Norzulaani Khalid Mr. Alimin Abdul Karim Dr. Nor Azma Yusuf	Reactocel : A Column Reactor for Cell Cultivation	**Silver**
Prof. Dr. Rosna Mat Taha Dr. Jamilah Syafawati Yaacob Ms. Azani Saleh Ms. Aziemah Abdul Manan Ms. Normadiha Mohamed Ms. Noraini Mahmad Ms. Norlina Rawi Ms. Ummi NurAin Abdul Razak	Floral Scientific Handicraft and Indoor Garden Derived From *in Vitro* Techniques	**Bronze**

RESULTS FROM SIIF 2013

RESEARCHER(S)	TITLE	AWARDS
Dr. Ahmad Saifizul Abdullah (PI) Prof. Mohamed Rehan Karim Dr. Rahizar Ramli Airul Sharizli Abdullah	Advanced Collision Avoidance System Featuring MSDG Technology	**Gold**
Dr. Chong Wen Tong (PI) Prof. Dr. Masjuki Haji Hassan Prof. Ir. Dr. Hew Wooi Ping Mr. Poh Sin Chew Mr. Ahmad Fazlizan Abdullah Ms. Yip Sook Yee Dr. Ong Zhi Chao Dr. Ong Hwai Chyuan Mr. Hamid Taheri	Shroud-Augmented Dual-Rotor Exhaust Air Energy Recovery Wind Turbine Generator	**Gold**
Dr. Ishenny Mohd Noor (PI) Dr. Badrul Mohamed Jan Dr. Ibrahim Si Ali Ir. Dr. Masitah Hasan Prof. K.B. Ramachandran Prof. Ir. Dr. Mohd Azlan Husain Prof. Nik Meriam Nik Sulaiman	Polipazyme™	**Gold**
Dr. Ahmad Saifizul Abdullah (PI) Prof. Ir. Mohamed Rehan Karim Airul Sharizli Abdullah	Portable and Automated Traffic Classifier	**Silver**
Dr. Ishenny Mohd Noor (PI) Dr. Badrul Mohamed Jan Dr. Ibrahim Si Ali Ir. Dr. Masitah Hasan Prof. K.B. Ramachandran Prof. Ir. Dr. Mohd Azlan Husain Prof. Nik Meriam Nik Sulaiman	Biopro Diesel™	**Bronze**
Dr. Chong Wen Tong (PI) Prof. Dr. Masjuki Hj. Hassan Prof. Dato' Dr. Kamaruzzaman Sopian (SERI, UKM) Prof. Dr. Hsiao Fei-Bin (NCKU, Taiwan) Mr. Poh Sin Chew Mr. Ahamd Fazlizan Abdullah Mr. Mohammad Reza Hassan Mr. Chey Kok Kit Mr. Wan Khairul Muzammil Abd Rahim Ms. Yip Sook Yee	Eco-Greenergy™ Interactive Outdoor Lighting System (powered by shrouded wind turbine & solar panel)	**Bronze**

RESULTS FROM PECIPTA 2013

RESEARCHER(S)	TITLE	AWARDS
Prof. Dr. Ramesh T. Subramaniam (PI) Prof. Dr. Abdul Kariem Arof Dr. Ramesh Kasi Ms. R. Shanti Rajantharan Mr. Ng Hon Ming Mr. Mohd Zieauddin Kufian Dr. Ezra Morris Abraham Gnanamuthu (UTAR) Dr. Chee Swee Yong Dr. Vengadaesvaran Balakrishnan	Highly Stretchable Adhesive Green Polymer Electrolyte for Electrochemical Applications	**Gold** **and** **Best of The Best (Electrical & Electronic Theme)**
Assoc. Prof. Dr Kim Kah Hwi (PI) Prof. Dr. Cheah Swee Hung Dr. Kim Wee Ric Dr. Chin Kah Chuan Mr Tan Kok Keong Mr. Lim Kok Hong	CardioPro™ : A Nutraceutical Preparation for Lowering Blood Pressure, Plasma Triglyceride, LDL and Glucose and Increasing HDL, for reducing risk of cardiovascular disease and diabetes.	**Gold** **and** **Best of The Best (Medical, Pharmaceutical & Health Theme)**
Prof. Datuk Dr. RohanaYusof (PI) Prof. Dr. Noorsaadah Abd Rahman Dr. HussinA.Rothan Heh Choon Han Ammary Y. Abdulrahman	A Novel Dengue Protease Assay Kit	**Gold**
Prof. Dr. Mary Anne Tan Jin Ai (PI) Prof. Dr Chua Kek Heng Kho Siew Leng	Thal^{ME} - A Taqman genotyping detection system for rapid identification of common β-thalasaemia mutations	**Gold**
Prof. Dr. Sharifah Bee Abd. Hamid	Low Energy Highly Active Green Catalyst Of Copper For Hydrogenation Of Fatty Esters To Fatty Alcohols	**Gold**
Dr. Lai Chin Wei Prof. Dr. Sharifah Bee Abd. Hamid Assoc. Prof. Dr. Srimala Sreekantan (USM)	A Novel Photocatalyzer : An Inspired Solution For Ultimate Decolorization of Organic Pollutant	**Gold**
Dr. Zahra Naimie (PI) Dr. Norasmatul Akma Erkan Sabanovic (Tech Leader and Programmer) Prof. Dr. Noor Hayaty Abu Kasim Dr. ZetiAdura Che Ab Aziz Dr. Azwatee Abdul Aziz Assoc. Prof. Dr. Chua Yang Piaw	A-EZ Prosthodontics (Creating A Virtual environment to Facilitate the Learning of Crown Constructions for Dental Students)	**Gold**
Dr. Ram Gopal Raj (PI) Assoc. Prof. Dr. Datin Sameem Abdul Kareem Dr. Rukaini Haji Abdullah Dr. Rohana Mahmud Dr. Norisma Idris Dr. Maizatul Akmar Ismail Dr. Fariza Hanum Md. Nasaruddin Marjan Mansourvar	An Automated System for Bone Age Assessment Using Combined Method	**Silver**
Prof. Dr. Rosna Mat Taha (PI) Sadegh Mohajer Noraini Mahmad Azani Saleh Hashimah Elias Aziemah Abdul Manan	Artificial Seeds of Sainfoin (Onobrychis Sativa L.)-A Novel Forage Crop for Ruminant's Feed	**Silver**

RESEARCHER(S)	TITLE	AWARDS
Dr. Ahmed Aly Diaa Mohammed Sarhan (PI) Prof. Dr. Mohd Hamdi Abd Shukor Prof. Javad Akbari Dr. Noor Azizi Prof. Mohammad Reza Movahhedy Seyed Reza Besharati Abdul Hadi Jalaludin	A Novel design of CNC Gantry Machine with Double Motion Mechanism	**Silver**
Prof. Dr. Yatimah Alias (PI) Dr. Mohd Rais Ahmad Dr. Woi Pei Meng Mr. Ahmad Nazmi Bin Rosli	Portable USB Sensor for Body Metabolites Detection	**Silver**
Prof. Dr. A.S. MD Abdul Haseeb (PI) Mr. Sujan Kumer Ghosh Dr. Amalina Muhammad Afifi	A Method of In-Situ Targeted Interfacial Alloying of Lead-Free Solder Joints	**Silver**
Prof. Dr. Loo Chu Kiong (PI) Md. Nazrul Islam Parham Nooralishah Liew Wei Shiung Noel Tay Nuo Wi	HeartCAM - Non-Contact, Automated Heart Rate Measurement Using Camera	**Silver**
Prof. Mahmoud Moghavvemi (PI) Ong Yee Lun Alireza Safdari	A Vision Aid for Color Blind People	**Silver**
Prof. Dr. Misni Misran (PI) Dr. Teo Yin Yin Chia si Wai Tan Hsiao Wei Vicit Rizal Eh Suk	Fatty Acid Liposomes for Cosmetic Applications	**Silver**
Dr. Azuddin Mamat (PI) Prof. Dr. Imtiaz Ahmed Choudhury Prof. Dr. Zahari Taha Assoc. Prof. Dr. Nukman Yusoff	Vertical Injection Molding Machine for Macro and Micro Molding Application	**Bronze**
Assoc. Prof. Dr. Nor Hafizah Ramli @ Sulong (PI) Mahdi Shariati Dr. Meldi Suhatril Mohamad Mehdi Arabnejad Khanouki Ali Shariati	Optimized and Efficient Composite Floor System Using Novel Angle Shear Connector	**Bronze**
Prof. Dr. Jaffar Ali M.Abdullah	Disposable Ablution Pack™ (DAP)	**Bronze**
Prof. Dr. Misni Misran (PI) Woo Juin Onn Vicit Rizal Eh Suk Yew Han Choi	Fatty Acid Nanoparticle For Topical And Oral Delivery Applications	**Bronze**
Prof. Dr. Vickneswaran A/L Mathaneswaran Prof Dato' Dr Zainal Ariff Bin Abdul Rahman Mr. Yuwaraj Kumar Balakrishnan Mr. Tan Su Tung Mr. Alwin Kumar Rathinam	Surgical Volumetric Biomodels of Human Anatomy	**Bronze**
Prof. Dr. Vickneswaran A/L Mathaneswaran Prof Dato' Dr ZainalAriff Bin Abdul Rahman Mr. Yuwaraj Kumar Balakrishnan Mr. Tan Su Tung Mr. Alwin Kumar Rathinam Mr. Amir hossein Mehbodniya	MEDCOM OR	**Bronze**

PECIPTA 2013 Best of The Best Award Winner (Electrical & Electronic Theme)- Highly Stretchable Adhesive Green Polymer Electrolyte for Electrochemical Applications

Prof. Dr. Ramesh T. Subramaniam is attached to the Physics Department, University of Malaya, specializing in the field of advanced materials. He is also the deputy head for the Centre for Ionics, University of Malaya (C.I.U.M.). Prof. Ramesh is well known for his achievement in research even before stepping into UM and has progressed to become more visible in his field by fully utilising all the benefits that UM has provided. He has also won numerous medals and more than 20 distinguished awards nationally and internationally. His contribution in research has attracted the interest of many national and international publishers. He has more than 100 international journal and conference papers to his credit. He has also been actively involved in patenting his research invention.

Prof. Dr. Ramesh T. Subramaniam receiving his award

Pecipta 2013 has been a great step forward for Prof. Dr. Ramesh T. Subramaniam in advancing his invention to become a marketable commercial product. His brilliant invention, was credited with the prestigious **"Best of the Best"** award and a **Gold Medal**. Prof. Dr. Ramesh and his team members were able to find a solution to a problem that has been an obstacle for researchers and industries worldwide.

In the near future, the solid polymer electrolytes, which is still undergoing improvements, is tipped to substitute the usage of liquid electrolytes in electrochemical devices. Liquid electrolytes have been used in numerous energy applications but some of its limitations is a factor to find better substitutes. It has been identified that the instability of the liquid electrolyte at the interfaces of two active electrodes is the contributing factor for all the failures.

Innovative Solution

This invention is capable of overcoming most of the limitations present in the currently available commercial products. The safety of the electrochemical devices has always been an issue especially when the device is subjected to prolonged usage. This makes the device exceed working temperatures which contributes to some severe safety issues. This drawback was tackled by the research group by formulating a polymer electrolyte that has a thermal-shutdown feature. This feature comes into effect on exceeding certain temperature which is due to the temperature dependent adhesion property of the polymer electrolyte. With this innovative feature many cases of failure which may lead to life threatening issues can be eliminated.

Challenges

The invention of adhesive polymer electrolyte is an outcome of two years of dedicated work undertaken at the Center of Ionics, University of Malaya. This project is undertaken with financial assistances from various bodies such as UMRG, MOSTI and MOHE. Finally, an advanced testing was done by one of the leading battery manufacturing companies in Malaysia. Prof. Ramesh and his research group had a challenging time in transforming the idea of PTFE sticking polymer electrolyte into a useful product that can penetrate into the commercial market. The research group spent a considerable amount of time in brainstorming sessions to further understand and strengthen the invention.

Applications

The adhesion type of polymer electrolyte membrane was developed by keeping in mind a few targeted limitations for the utilization of thin film polymer electrolyte with regard to liquid electrolyte. This innovative invention will improve the performance of the electrochemical devices along with improved safety during prolonged usage. In terms of performance, this polymer electrolyte membrane will exhibit the same type of properties as that of non-adhesive polymer electrolyte. The adhesion found on the surface of the polymer electrolyte helps in affixing the electrodes with optimum interfacial contact between the electrolyte-electrode. The absence of liquid compartment also contributes to improvements in safety and performance. The occurrence of chemical reaction at the electrode-electrolyte interface can be avoided and the liquid will not dry due to heat released during the charging and discharging cycles. In terms of safety features, the membrane is designed to undergo a thermal-shut down after the temperature exceeds a certain value.

Features and Specifications

The polymer electrolyte membrane works as a "smart material" whereby after a certain temperature the membrane losses its adhesive property and leads to a thermal shut down. Upon cooling, the membrane's adhesive property will recover fully. The highest open circuit voltage for the device fabricated using this polymer electrolyte membrane with a thickness of approximately 100 micrometer (V_{oc}) was found to be around 3 V. The V_{oc} value is found to sustain for few months using a normal device packaging in lab environments. The battery fabrication was done in the form of coin cell.

Prof. Dr. Ramesh T. Subramaniam at PECIPTA 2013

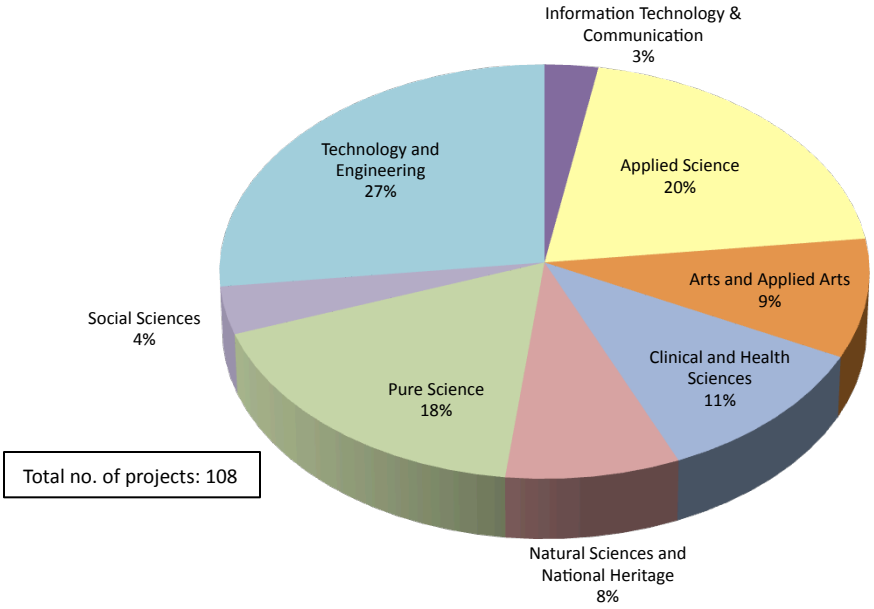
Inventors

Prof. Dr. Ramesh T. Subramaniam
Center for Ionics of University Malaya (C.I.U.M),
University of Malaya
Tel : 03-7967 4391
Email: ramesh@um.edu.my

RESEARCH GRANTS FROM THE MINISTRY OF HIGHER EDUCATION-FRGS,ERGS, LRGS, PRGS

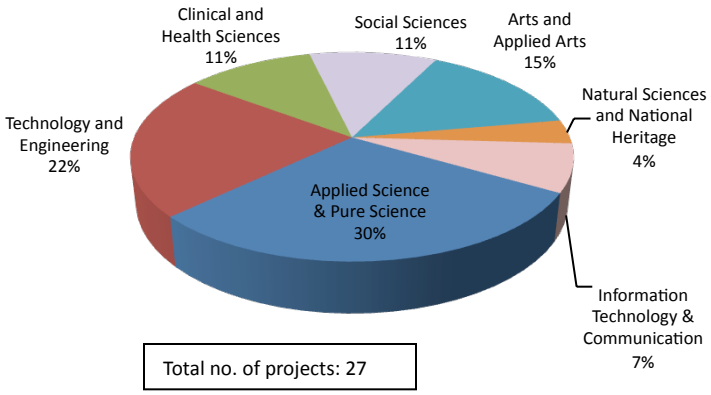
In 2013, The Ministry of Higher Education (MOHE) has offered a number of research grant schemes which are: Fundamental Research Grant Scheme (FRGS), Exploratory Research Grant Scheme (PRGS), Prototype Development Research Grant Scheme (PRGS) and Long-Term Research Grant Scheme (LRGS). For this year (2013), the University of Malaya has been awarded a total of 138 MOHE Research Grants amounting to **RM 14,702,034**

2013 FRGS SUCCESSFUL PROJECTS BY RESEARCH AREA



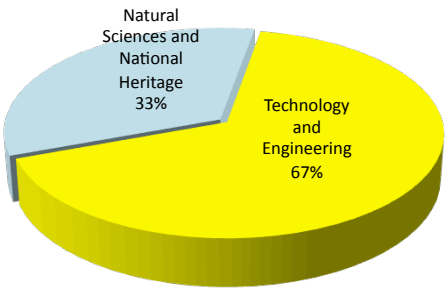
Total no. of projects: 108

2013 ERGS SUCCESSFUL PROJECTS BY RESEARCH AREA



Total no. of projects: 27

2013 PRGS SUCCESSFUL PROJECTS BY RESEARCH AREA



Total no. of projects: 3

TRANSGENDERISM: A MALAYSIAN PERCEPTION

By: Dr. Zuraidah Abdullah

Introduction

Any discourse related to transgenderism is highly controversial, particularly in the context of Malaysia, where people have yet to accept those who are also known as "the third identity." This issue does not only exist in certain countries but almost every country in the world but with differing names (Zaini, 2004), for example, *Waria* in Indonesia, *Hijra* in India and Bangladesh, *Xanith* in Oman, *Mak Nyah* in Malaysia and *Kathoey* in Thailand (Teas, 2001; Winter & Udomsak, 2002; Kartini Slamah, 2005; Juwilda, 2010). Tapped from the Malaysian context, the transgender phenomenon is not a foreign social problem anymore. Several existing perspectives arise in terms of issues faced by this group. The male to female (MTF) transgender group is normally known as male transvestite or *Mak Nyah* among the locals, who look and feel that they belong to the feminine gender (Tea, 2001; Kartini Salmah, 2005) while the female-to-male (FTM) or *Pak Nyah* is the group of women who feel that they are inherently males (Teh, 2001). The actual number of transgender individuals living in Malaysia is still unclear; however according to the statistics of the Pink Triangle Foundation (PT Foundation), Azis Ngah (Daily News, July 27, 2008) states that the number has increased from 25,000 to 30,000 people (Human Empowerment Activist Association (API), 2008).

This indicates that the transgender populace is growing in Malaysia at a high rate. Although there are no accurate statistics in determining the global population, we cannot deny the existence of this minority group. The negative perception and discrimination placed upon the transvestites in Malaysia, both in terms of their rights and freedoms, are incompatible with the religion and culture of the country. Discrimination against those in terms of treatment as members of the community still occurs in Malaysia. In fact, the worst on record is the frequent occurrence of violence and repression against the group.

For example, as stated by Sima Barmania (thelancet.com 2013), "We try to educate the public and religious leaders not to discriminate against transgender people but when they enter the mosque to pray, they get shoes thrown at them". The existence of transgender people is described as a 'disease' that disrupts the systemic balance of the societal norms. They are also looked down upon cynically by the public although transvestites, are also part of the community.

The availability of published data on the transgender population is very limited. This suggests that transgender individuals face numerous social and psychological issues, violence in society, such as gender identity, HIV-AIDS, poverty, discrimination, verbal harassment, racism, unemployment, and abuse that denies their opportunity to live self-determined and healthy lives (Operario, Burton, Underhill, & Sevelius, 2008; Schilt & Wiswall, 2008). To some extent, some transgender individuals turn to sex work to fulfill their daily needs (Edwards, Fisher, & Reynolds, 2007; Operario *et al.,* 2008 which increases their risk of contracting HIV (Nemoto et al., 2004). As many transgender individuals are vulnerable to societies' prejudice and abuse it is important to investigate and understand the perspective of the society, in order to find ways to alleviate this problem.

Methodology

The team is led by Dr Zuraidah Abdullah as the project leader, Prof Datin Dr Azizan Baharuddin, Assoc. Prof Dr Raihanah Abdullah, Prof Golam Dastagir and Mr Chang Lee Wei. This exploratory study reports on the results from one quantitative research initiative developed in the context of an on-going community-based participatory research process that began in November 2012.

Data were collected from a questionnaire which was structured to reflect four constructs leading to four important dimensions; knowledge, religion, acceptance and human rights. The questionnaire was distributed to 800 Malaysians (248 men, 552 women) ranging from the age of 15 to 55 years old. The participants were from various ethnic groups (645 Malay, 75 Chinese, 64 Indian, and 16 others). The educational levels of the participants varied according to their age and experience. Out of the total participants, 80.6% (645 people) were Muslim, 7.25% (58 people) were Buddhist, 6.0% (48 people) were numbers of Hindu, 5.75 % (46 people) were Christian and only 0.4% belonged to other religious groups.

Findings

The results showed that the following were discussed thoroughly human rights, gender, language, social implication, economy, education, health and medical issues, and culture. Almost all of the participants indicated that the Malaysian society has some awareness of transgenderism. The term *Mak Nyah* was the most commonly used term to describe the transgender people. There were also differing views from the Malaysian community on the transgender group, whereby 79.7% (657 people) viewed them as having gender conflict while 46.7% (374 people) viewed them as having problems with their sexual orientation. However, 55.5% rejected (444 people) the notion that the people from this group are mental patients (Diagram 1).

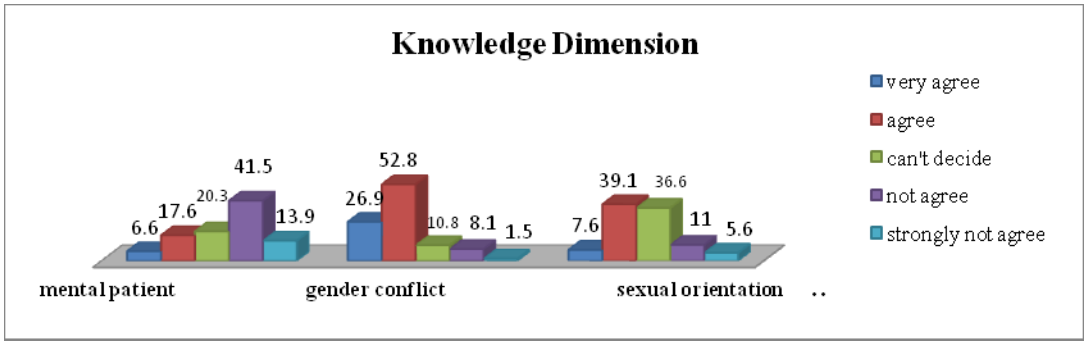


Diagram 1 . Knowledge dimension: The participants' perspective towards transgender people

From another perspective, the Malaysian community is generally perceived to hold on to religious elements when dealing with issues related to the transgender community, which indirectly influences their impression of this group (68.1%, or 544 people). Religion is one of the dominant factors influencing the stigma of a community that is being given to the studied group (59.5% or 476 people).

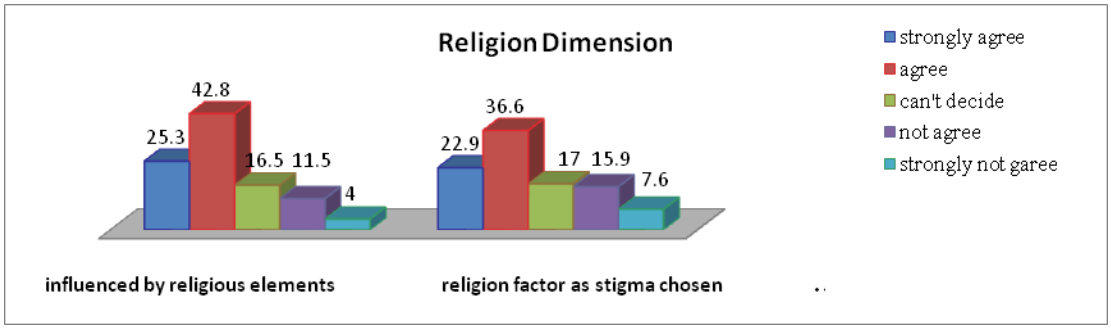


Diagram 2. Religion dimension: The participants' perspective towards transgender people

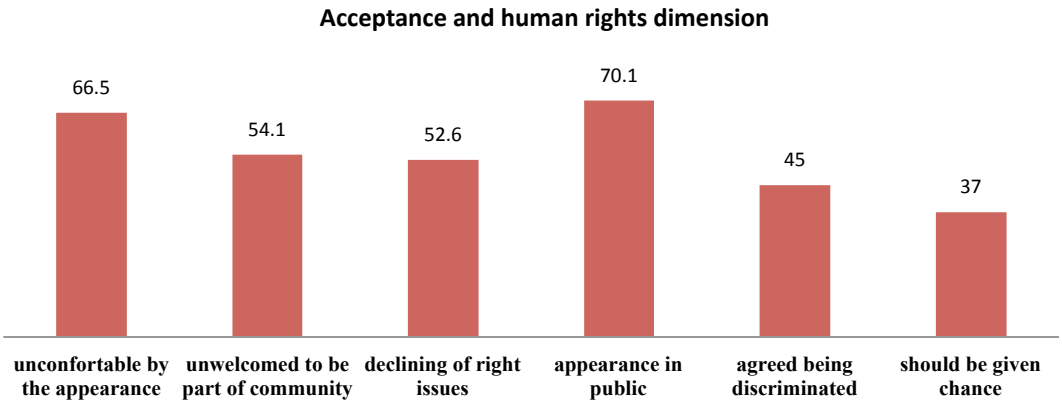
According to Diagram 3, 66.5% of the community did seem uncomfortable by the appearance highlighted by the transgender group (532 people). Apart from that, this study also found that the transgender group was solely unwelcomed as part of the society (54.1% or 433 people).

This study also analyzed the struggle propagated by the transgender group for recognition of their rights. Almost half of projected a negative perception when it came to the rights issued to the transgender people (52.6% or 421 people). A total of 74.7% of the respondents issued a complete rejection when it came to the question of whether one should be given the right to choose their gender (598 people). In addition to the stigma, 45% (360 people) of the community admitted that these people are discriminated by the society. However, it was agreed that transgender people should be given the right to seek a better life in Malaysia (37.0% or 303 persons), covering crucial areas such as employment, housing, health services and so on. This is due to the fact that most of the respondents were not very sure of the welfare facilities provided to this group (37% or 246 people).

Conclusion

Having such different needs and desires than what it is expected definitely presents the transsexual people with difficulty in living their lives to the fullest especially when dealing with public opinion. It should be noted that mindsets are one of the causes for violation of moral and social norms which consequently push the "marginalized groups" in society towards immoral activities for which they themselves cannot be held responsible. If so, then it is an indirect response to the denial of their rights and freedom as enjoyed by other members of the society.

Overall, the results suggested that the society does not only reject the existing group of transgender people but further analysis showed that they are more confused and do not know how to deal and react whenever they encounter transgender people, thus leading to a total rejection as the final act. The scholars and authorities have to act and do something in order to address the root problem. Both sides of the society should be educated in order to solve the problems. From the human rights perspective, it should be noted that, transgender people are also entitled to the same rights and facilities enjoyed by other members of society without any limitation in order to succeed and live a comfortable life.



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DIGITAL PRESERVATION OF CULTURAL HERITAGE HIGH-RESOLUTION SCANNING OF THE PUA KUMBU

By: Mohamad Hilman bin Nordin, Prof. Dr. Mohd Hamdi Abd Shukor, Prof. Dr. Harold Thwaites (AMMP Centre)

Introduction

Iban women in the longhouses of Sarawak have been weaving beautiful handmade textiles known as Pua Kumbu since ancient times. These textiles are used for decorations in longhouses and in various rituals and celebrations. The patterns on the Pua Kumbu are unique, each inspired from the individual weaver's dreams and imaginations. Sadly, this century-old practice is dying, from the lack of the young generation's willingness to take up the art due to the tedious and time-consuming process and the demands of modern life.

Digitisation of the Pua Kumbu in progress using UM's High Resolution Scanner

UM's Centre of Advanced Manufacturing and Material Processing (AMMP Centre) is developing a High Resolution Scanning Device as a result from a long collaborative work with a research group from Kyoto University's led by Professor Ari Ide-Ektessabi.

The technology has been used to digitise and analyse various cultural heritage in Japan, many artworks and paintings – some of them are on traditional Japanese panels and others on long scrolls. The Kyoto University has also been able to digitise wall paintings inside temples with restricted access.

Advantages

The digitisation of cultural heritage is seeing increasing demands worldwide. The biggest benefit of having digital records of these heritage are that they can be used, accessed, viewed and analysed without the worry of the detrimental effects of humidity, luminosity and human intervention on the items being inspected. The preservation and conservation of cultural heritage is multidisciplinary in nature, as it involves the management of the state-of-the-art engineering technology and the knowledge of cultural heritage itself.

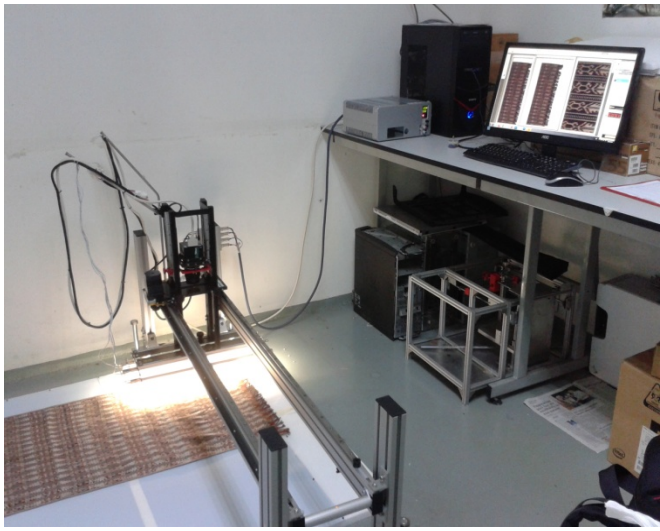
Digitised work may be analysed mathematically, but in the end, experts on the work are needed to offer the necessary interpretations. To begin the same revolution in the conservation and preservation of cultural heritage in Malaysia, AMMP Centre is collaborating with Professor Harold Thwaites and his team from the Centre for Creative Content and Digital Innovation, University of Malaya to digitize the Pua Kumbu textiles.

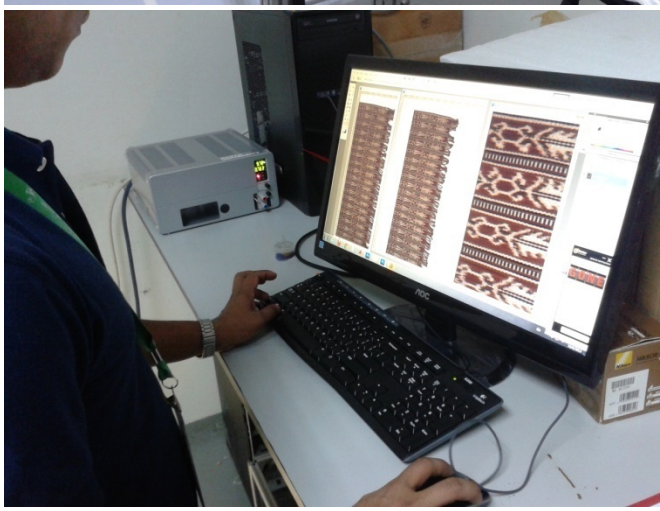
Novelty

AMMP's High Resolution Scanning Device can scan flat objects up to 1,000 dpi with very high colour accuracy, more than sufficient to capture the images of the Pua Kumbu textile in high resolution. These digital recordings can be virtually manipulated, copied, analysed without the need for the actual physical specimen to be present. Subsequent development on the Pua Kumbu will include creating a visual database of different patterns of the textile. Colour analysis can identify the attribute of the natural dye used and can be replicated to preserve the original vibrant colours of the textiles. The different colours and patterns of Pua Kumbu can be also be digitally showcased in museums and art galleries to complement the original ones on display, or displayed on their own, to keep the originals from unnecessary exposure.

Conclusion:

We envision the use of digital display technology to tell history and display artefacts would be the norm for museums and art galleries in the future. The possibilities of interactive display may interest young generations to frequent museums and art galleries to appreciate our national history and heritage. Although a high resolution image of an artefact may not substitute the real object, it will certainly be a great help in further understanding, handling, preserving and opening up its access to a wider range of audience. This multidisciplinary project on digitising the Pua Kumbu is hoped to be a beginning towards preservation and conservation of many other national heritage.





Postprocessing of the Pua Kumbu in the PC after the digitization

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FROM ORGANIC SEMICONDUCTOR TO MULTI-FUNCTIONAL ELECTRONIC DEVICES

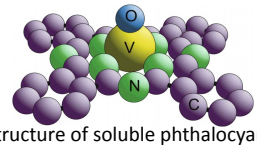
By: Dr. Khaulah Sulaiman

Introduction

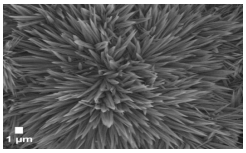
Organic semiconductors offer distinctive features such as tunability of electronic properties, easy in device fabrication, mechanical flexibility, low-cost manufacturing, and glib incorporation with chemical and physical functionalities. We present investigations on a soluble phthalocyanine, VOPcPhO as a potential organic material to be incorporated into photovoltaic solar cell, humidity sensor and photodiode. We intent to develop the reliable, cost-effective, facile fabrication and accurate multifunctional electronic devices.

Methodology

Organic semiconductor of phthalocyanine, VOPcPhO can be conveniently utilized in solution processing technique to form homogeneous nano-scale thin film using a spin-coating method. The molecular structure of VOPcPhO is shown in Figure 1 (a).



(a) Chemical structure of soluble phthalocyanine, VOPcPhO.



(b) FESEM image of VOPcPhO showing the nano-flower like structure.

(i) Photovoltaic solar cell

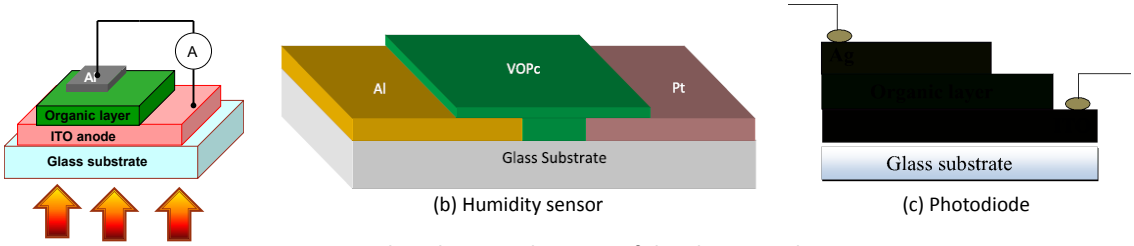
Organic semiconductor thin film was sandwiched between indium tin oxide (ITO) and aluminium electrode. In order to increase the efficiency of the solar cells, several approaches have been explored including formation of nano-structured organic material as shown in Figure 1. The construction of solar photovoltaic device is presented in Figure 2 (a). The electrical properties were measured using a Keithley SMU under the light of a standard solar simulator.

(ii) Humidity sensor

Organic film was placed in a small gap between two silver electrodes to form a planar structure as shown in Figure 2 (b). The in situ capacitance and resistance versus RH measurements of the sensor, at ambient temperature were, carried out by placing the device in a homemade hermetically sealed humidity chamber capable of providing a humidity range of 0–95% RH. Commercial digital humidity and LCR meters were employed to record the data.

(iii) Photodiode

Figure 2(c) shows the photodiode construction, which was prepared in sandwiched type: organic layer between ITO and silver electrodes. The photocurrent response was measured after switching the light between ON and OFF states.



(a) Solar cell

(b) Humidity sensor

(c) Photodiode

Figure 2: The schematic diagrams of the electronic device construction.

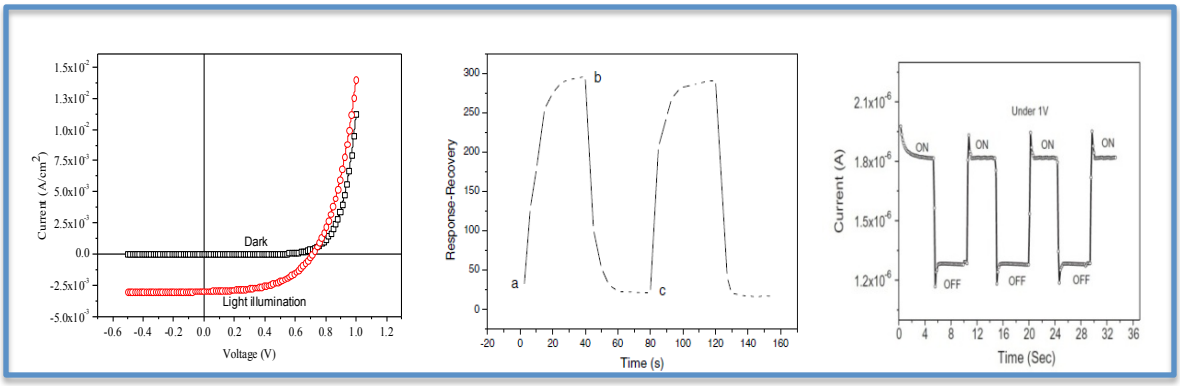


Figure 3: (a) Current-voltage characteristics of the solar photovoltaic cell; (b) The response-recovery curve of the humidity sensor; (c) The change in photocurrent after switching the light between ON and OFF states

Results and Discussion

Figure 3 (a) shows the photovoltaic effect of the device in the dark as well as under light. The solar cell containing VOPcPhO material has the potential to be applied in bulk heterojunction system, due to its high absorption solar spectrum in the visible region and considerably good electrical behaviour. It is found that the External Quantum Efficiency (EQE) of this solar cell device shows the photons over the whole visible range have been utilized (result not shown here). The results from this study also show that the VoPcPhO has bipolar transport and can act as electron as well as hole transporting material. The electron mobility is comparable with hole mobility.

Figure 3(b) shows the response-recovery curve of the humidity sensor. It is found that the capacitance increases while the resistance decreases with increasing level of RH (results not shown here). The increase in the capacitance can be attributed to the enhanced dielectric constant of the active layer due to water vapour adsorbed. On the other hand the resistance is greatly affected by the change in the dipole moment due to dissociation of water molecules adsorbed on the surface. Adequate sensing properties such as enough sensitivity, good selectivity, linearity and reasonable response and recovery times have been obtained. The humidity-dependent properties of the sensor make it a good match for its potential application in commercial hygrometers. Figure 3(c) illustrates the change in photocurrent after switching the light between ON and OFF states. The sensor exhibits good photoresponsivity, photoconductivity, rapid change of states and photocurrent shows a stable plateau value.

Conclusion

It has been found that VOPcPhO thin film has the potential to be applied for photovoltaic solar cell, humidity sensor as well as photodiode due to its high absorption, considerably good light harvesting in the visible range of the solar spectrum and better charge transfer. Since the device fabrication is inexpensive to manufacture, therefore, it has a great potential for practical application such as for a smart car.

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MASS PROPAGATION OF SAINFOIN (*ONOBRYCHIS VICIIFOLIA* SYN. *ONOBRYCHIS SATIVA* L.) - A NOVEL FORAGE CROP THROUGH SYNTHETIC SEED TECHNOLOGY

By: Prof Dr. Rosna Mat Taha, Sadegh Mohajer

Introduction

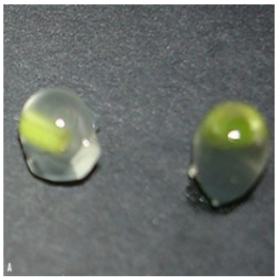
The forage legume Sainfoin is a crop which has adapted well to the dry and semi-arid regions where the cultivation of alfalfa, the most important forage crop, is restricted by the environmental conditions. Malaysia spends billions of ringgit to import hay and other livestock feeds. Sainfoin does not cause bloating to the animals and can be eaten raw or processed into animal feed. The synthetic seed technology, consisting of enclosed somatic embryo or micro-shoot or shoot bud, is a highly, promising propagation technique. This system provides an outstanding proficiency for mass propagation and preservation of plants. In Malaysia, this technique is rather novel.

Cultures of Sainfoin

Advantages

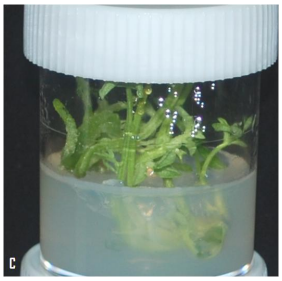
Through synthetic seed technology, large scale propagation of *Onobrychis viciifolia* syn *Onobrychis sativa* can be achieved. Genetic uniformity of the plants can be preserved. Natural seed production of Sainfoin is uneconomical since the crops are harvested at the flowering stage when the plants have the highest forage yield and the best fodder quality, however, the seeds have not fully developed yet to be germinated, hence, there is a necessity for artificial seeds.

Moreover, production cost of the seeds and plantlets are cheaper using the synthetic seeds technology of Sainfoin as compared to normal propagation**.** This crop can be introduced to the market as a high quality forage crop for the first time in Malaysia as a ruminant`s feed. It is economical, since small pieces of tissues can produce unlimited number of plantlets or planting materials; can be transported to other countries due to the sterility of *in vitro* technique, hence, can ensure food security for the ruminants as well as for mankind indirectly.

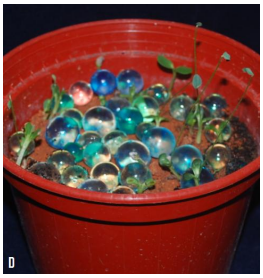


Artificial seeds of Sainfoin

Seeds germinating



Micro shoot production



Acclimatization

Novelty

- Artificial or synthetic seeds are easy to handle and inexpensive to transport due to their small size.
- The artificial seeds can be germinated when needed, even after storage.
- Product uniformity – as somatic embryos used are genetically identical.
- Also useful for germplasm conservation purposes.
- Consists of elite plant genotypes – protects and permits economical mass propagation of elite plant genotypes.
- Alternative method for the natural existing plant reproduction.
- Sainfoin can be grown in Malaysia thus reducing overseas import.
- Economical for livestock feeding. Storage life is much longer, seed viability remains good for longer period, potential for large scale propagation; very much suitable for large scale monoculture and also for mixed genotype plantations.

Finding

Mass propagation of Sainfoin has been achieved in this project through synthetic seeds technology. Artificial or synthetis seeds were created from small pieces of vegetative or somatic tissues of Sainfoin, an imported forage crop. This crop can be used as ruminant's feed and has many advantages. This novel crop can be introduced to Malaysia in order to cut down the cost of importing hay for ruminant's feed.

Awards

This project won the Silver Medal award at PECIPTA Expo on 7-9th November 2013, at KLCC. This project also won best poster award at UMRC 2013 (19-20th Nov 2013). The product and the methods of artificial seeds production were also filed for patent (PI2013700608).

Related Publications

S. Mohajer, A. A. Jafari, R.M. Taha, J. S. Yaacob and A. Saleh. (2013). Genetic diversity analysis of agro-morphological and quality traits in populations of Sainfoin (*Onobrychis sativa). Australian Journal of Crop Science 7 (7):1024-1031.*

R.M. Taha, J. S. Yaacob, N. Mahmad, N. Abdullah and S. Mohajer (2013). Synthetic Seeds Production and Regeneration of *Oxalis triangularis* for mass Propagation and Conservation. *International Journal of Environmental Science and Development, 4 (5):461-464.*

S. Mohajer, R. M. Taha, A. Khorasani and J. S. Yaacob (2012). Induction of different types of callus and somatic embryogenesis in various explants of Sainfoin *(Onobrychis sativa). Australian Journal of Crop Science, 6(8):1305-1313.*

P. K. Siong, S. Mohajer and R. M. Taha (2012). Production of artificial seeds derived from encapsulated *in vitro* micro shoots of cauliflower, *Brassica oleraceae var. botrytis. Romanian Biotechnological Letters, 17(4):7549- 7556.*

A.I. M. Yussof, S.N.A. wafa and R.M. Taha (2012). Plant Regeneration and Synthetic Seeds Production of *Brassica oleracea var. Italica. Acta Horticulturae: No. 958:179-186.*

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ORAL HEALTHCARE BEYOND BOUNDARIES - A MULTIDISCIPLINARY APPROACH

By: Dr. Jacob John

Introduction

The US Surgeon General's Report on Oral Health (2000) discussed the inequalities that affect vulnerable populations, in relation to untreated dental disease, access to dental care and the use of preventive services. The vulnerable population includes individuals and groups in society who have a physical, sensory, intellectual, mental, medical, developmental, emotional or social disability or, a combination of a number of these factors. The WHO estimated that 15% of the world's population has some form of disability. In Malaysia, this translates to more than 3 million disabled people. This global estimate for disability is increasing due to population ageing, rapid spread of chronic diseases, and improvements in the disability measurement tools.

People with Special Needs (PwSN) are more at risk for chronic diseases of the mouth, including dental caries and periodontitis, tooth loss, benign mucosal lesions and oral cancer as well as xerostomia and oral candidiasis. It has also been recognized that oral infections may affect the course and pathogenesis of a number of systemic diseases like cardiovascular disease, bacterial pneumonia and diabetes mellitus (Li, 2000). Oral health and nutrition also have a synergistic relationship. Since loss of teeth increases with age and the number of the elderly is increasing globally, it will continue to affect a huge population. Problems like decreased chewing ability, inability to eat, avoidance of hard foods, and decreased micronutrient diet inevitably have an impact on the overall health of PwSN. Interdisciplinary research which improves our knowledge on the systemic is therefore much required (Walls and Steele, 2004).

The primary aim of this research is to generate initiatives promoting better oral health for the disabled, institutionalized and marginalized population. Since late 2011, a number of studies related to the status of oral health, unmet needs, barriers and oral healthcare management strategies among PwSN in Malaysia have been undertaken and is ongoing. The target group covered thus far includes the prisoners, persons with visual disability and residents of elderly nursing homes.

Objectives

•To sensitize and train dental students in managing oral healthcare needs among PwSN beyond the four-walls of the dental surgery

•To reach out and provide oral healthcare services for PwSN

•To empower the healthcare providers with the knowledge and skills to manage the basic oral healthcare needs of PwSN

•To disseminate the research findings for the benefit of the stakeholders

Finding

All of the PwSN who were interviewed and examined have a basic problem with accessibility due to being institutionalized and their own dependancy.The majority lack the resources, functional ability or mental capacity to perform their own oral healthcare and therefore must rely on others. Thus, it is essential to equip the caregivers with adequate knowledge to provide their clients with better oral health and to improve their oral health status. The caregivers should be educated on the PwSN' basic oral health needs and be trained on how to provide care like brushing and flossing their teeth, preparing the right diet, managing their medication, alternative oral hygiene measures, denture care and identifying conditions that require referral to a dentist. They also need training on managing residents who resist the dental hygiene routine and pose other problems associated with their conditions. The change in oral health of the PwSN constitutes a two-way challenge, affecting both the dental personnel and caregivers.

The public dental service should also be strengthened to handle the increased dental treatment needs of this population. For such a programme to be effective, training, mandatory routines, adequate and appropriate dental aids and equipment as well as on-site support from dental personnel must be made available. On-site staff training and language skills are important if caregivers are to attain adequate oral care knowledge, attitude and practice skills.

References

Oral Health in America: A Report of the Surgeon General (Rockville, MD: U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health, 2000

WHO: World report on disability http://www.who.int/disabilities/world_report/2011/report/en/

Li X et al. Systemic diseases caused by oral infection.Clin Microbiol Rev. 2000;13(4):547-58.

Walls AWG, Steele JG. The relationship between oral health and nutrition in older people. Mechanisms of Ageing and Development. 2004;125:853-857

Related Presentations

Oral health needs of the Elderly : *9th Malaysian National Geriatrics Conference*; Kuala Lumpur, Malaysia (Sept 2013)

Mobile Prosthodontist : *8th Bienniel meeting of Asian Academy of Prosthodontics and 40th Indian Prosthodontic Society Conference*; Chennai, India (Dec 2012)

Oral health care needs and OHRQoL among prison inmates with HIV/AIDS Creating a Prison-Community Link for Oral Health : *21st Congress of the International Association for Disability and Oral Health*; Melbourne, Australia (Oct 2012)

Developing Empathy among Dental Students : *21st Congress of the International Association for Disability and Oral Health*; Melbourne, Australia (Oct 2012)

Cost estimation and planning for HIV/AIDS oral healthcare services: a Malaysian experiment :*1st International Science Symposium on HIV and Infectious Diseases*; Chennai, India (Dec 2012)

The changing role of prosthodontics for the aging world : *7th Biennial Meeting of Asian Academy of Prosthodontics*; Shanghai, China (Oct 2011)

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MALAYSIA'S GIANT FRESHWATER PRAWNS INDUSTRY: CHALLENGES & KEY ISSUES

By: Dr. Muhammad Ikmal Mohd Said

Introduction

This study of the giant freshwater prawns (*Macrobrachium rosenbergii*) is part of a multi-disciplinary research project under the "Traditional Knowledge: Nurturing Indigenous Industries, R & D and Domestic Industries". This research project is funded by the High Impact Research grant of the Ministry of Education.

Commercial farming of giant freshwater prawns, (GFP), began in the 1970s, following two scientific breakthroughs in the 1960s. Despite its illustrious links with key scientific discoveries that enabled commercial farming of the GFP, Malaysia's industry, with an output of 619 tonnes in 2010, represented just 0.3 percent of the world's output of 215,029 tonnes.

In the last five years, the country's outputs fluctuated from 246 tonnes in 2007, 355 in 2008, 552 in 2009, 619 in 2010 and 334 in 2011. These statistics suggest that the country's GFP industry is faced with a unsustainable productivity.

A broad research plan was drawn up to look at what appears to be an industry-wide problem. The study will examine the genetic make-up and distribution of GFP in rivers and farm environments, investigate breeding and pond technology practices at the farm level. It will also look at and the social and economic conditions under which GFP farming is carried out.

The social science component of this project is as ambitious as what is envisioned for the project as a whole. The social science component of the GFP study seeks to cover a large part of the value chain, extending from the purchase of wild broodstock right up to the sale of produce.

Freshly harvested prawns are put in a tub before being collected by buyers

Approach

By adopting a multi-disciplinary approach to the study of the GFP industry, a holistic perspective to understand the challenges of the industry is adopted. The behaviour of farmers could be linked to their immediate conditions (size of farm, level of education, etc.) and also to their relationships with other players in the value chain.

Observations arising from the fieldwork for the social science study carried out in Perak in the last months indicate that the industry is, indeed, facing a broad spectrum of challenges that only a multi-disciplinary approach can reveal.

It is clear from the survey in Perak that the fluctuating output of GFP farms in Malaysia is, in part, due to the shortage of seeds (post-larvae, juveniles). This could stem from several factors, all of which need to be studied carefully.

The main factor is the varying, and unpredictable quality of wild broodstock, sourced almost wholly, at least among hatchery operators in Perak, from the river system in Teluk Intan. Hatchery operators complain that larvae mortality rates are not very predictable, and are occasionally very high. On other occasions, seeds may be deemed unhealthy and are not sold even when mortality rates fall within the normal acceptable range.

There is very little social science research on GFP farming in Malaysia. Our study will be a landmark study, since it is a multi-disciplinary study. It further covers a great majority of the farms in the states of Perak, Kedah, Pahang and Negeri Sembilan, the four leading states in GFP farming in the country.

Conclusion

It is evident that the problems facing Malaysia's GFP industry is multi-dimensional. It needs a multi- or cross-disciplinary perspective and team to unearth the full story on the low but large fluctuations in Malaysia GFP output.

This broader view will highlight key policy issues that will need to be addressed by the state to enable the GFP industry to move forward. To encourage greater investment and growth in GFP farming, we will need to liberate farmers of the constant threat of inadequate seeds of varying, and unpredictable quality. In turn, this could make the GFP industry a more attractive investment destination.

Two of the family's six growout ponds, Kampung Teluk Mas, Rantau Panjang, Selama, Perak

Harvesting tub, Kampung Ulu Kenas, Kuala Kangsar, Perak

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MyCite: THE NATIONAL CITATION INDEXING SYSTEM

By: Prof. Dr. A.N.Zainab, Assoc. Prof. Dr A. Abrizah & Dr R.G. Raj

Introducing *MyCite*

To solve the problem of poor representation in the Web of Science (WoS) and Scopus, some countries especially in Asia, have been developing their own citation indexing system. In Malaysia, the proposal for the setting up of a national abstracting and indexing system was first raised at a publishers conference in 2006. The Ministry of Higher Education (MOHE), Malaysia eventually saw to the approval of the setting up of a Malaysian Citation Centre (MCC), which is responsible for the Malaysian Citation Index system (*MyCite*). The development of the system was mooted by MOHE mainly to help improve the quality, accessibility and visibility of national journals by providing publishers with indicators that show their journal performance within Malaysia. To realize this aspiration, an interim MCC was set up at the Faculty of Computer Science and Information Technology, University of Malaya. *MyCite* was developed in-house collaboratively between MCC and the Information Technology Centre, University of Malaya.

What it does

MyCite (www.mycite.my) indexes only scholarly journals which loosely refer to Malaysian-based titles that are refered to. Even though an audit on Malaysian scholarly journals identifies a total number 464 titles, the total number of journals currently indexed in *MyCite* are 155 titles and this is expected to grow to 250 by 2015. *MyCite* focuses on a selection of journals that are already indexed by WoS, Scopus and *MyAIS* (Malaysian Abstracting and Indexing System) (http://myais.fsktm.um.edu.my/) as well as titles that have complete issue runs between 2007 and 2011. This decision was made basedon several reasons.

Firstly, the focus is to provide adequate coverage on each title so that there is sufficient data to test the correctness of indices used. The performance indices used are total publications, total citations, impact factor for data sets within a two-year and five-year windows, h index, and ISI's *Journal Citation Reports* (JCR) immediacy index, and citation half-life. It is expected that journals that have at least a 5-year publishing track record would respond well to the bibliometric measures and show some results. Secondly, the targeted journals are mainly those which are electronically published and on "Open Access". This provides MCC with access to articles' references which is needed to generate the citation scores. Thirdly, it was possible to quickly populate *MyCite* with data from *MyAIS* .

MyCite categorises journals into five broad fields; Arts and Humanities, Engineering and Technology, Medical and Health Sciences, Sciences and Social Sciences. Under each broad field, journals are further assigned to more specific fields. This categorisation is found to be sufficient to accomodate most Malaysian journals. Editorial notes and book reviews are excluded from this process. For articles in the "religion" category, titles and references in Arabic or Jawi text are not indexed.

Its development

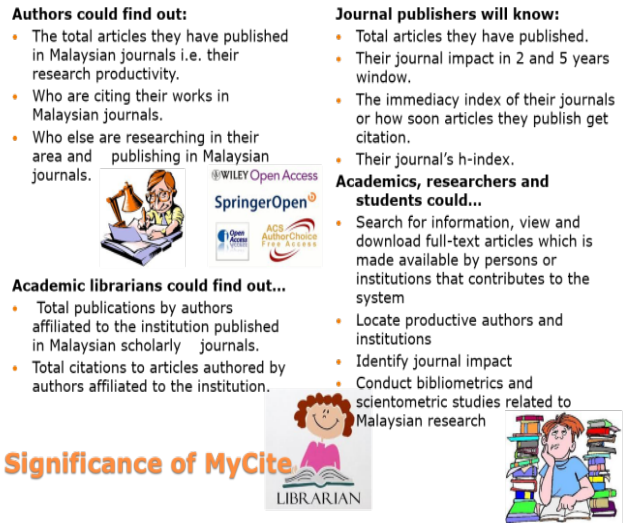
Mycite was developed using the rapid prototyping method. The development of modules was benchmarked against WoS and Scopus as MOHE requires the system to be up within a year. To ensure *MyCite* functions optimally, two databases were created. *MyJurnal* (www.myjurnal.my) is the supportive journal repository which manages the bibliographic data extracted from journals. On its own it is a complete journal management system which publishers can use to manage article submissions, reviewing processes and publication of issues.

MyJurnal provides access to full-text articles when consent is given by publishers. *MyCite* is the citation indexing system that extracts bibliographic data sets indexed in *MyJurnal* to provide publication counts. All references in articles that are indexed are passed through an automated reference segmentation programme called the "reference editor" that breaks the bibliographic references (e.g. author, title, journal, year) extracted from the references section of all articles.

Its significance

Research performance at the national levels can now be gauged with *MyCite.* Author, journal, institution and country's performance in terms of publication productivity and impact is obtainable from *MyCite* based on the journals indexed. The value of MyCite lies in the performance reports it generates, as summarized in Figure 1.

Figure 1: The Added Value: Performance Reports Generated by *MyCite*



Limitating Situations

The development of MyCite was not without its problems. The main problems arise from the limited access to the journals contents themselves. Journal publishers are often unaware of the importance of being indexed in universal or national indices. Secondly, the quality of some journals needs to be improved. One good example is the problems faced by indexers to ascertain variant names of authors and institutions.

Some authors adopt several forms of their name in their publications. This inconsistency affects the counting of their publication productivity and citations. Though *MyCite* this can be solved by merging the various names when counting, whilst still displaying the variant forms as originally found in the articles. Another limitation is the variation of referencing style adopted by authors in a single journal or in some instances, within the same article. We estimate there are about 40 referencing styles used by authors publishing in Malaysian journals. This may be caused by authors' disregard of publishers' instructions. These situations posed problems in fine tuning the reference algorithmn (reference editor) so that accurate segmentations all article references is achieved because poor referencing may result in loss of citation.

Conclusion

MyCite is currently available to the global community in the hope to increase the visibility of Malaysian journals. *MyCite* through *MyJurnal* attempts to control Malaysian scholarly journals bibliographically and at the same time reports on their performance through bibliometric indices which are common to most other citation indices. In summary, *MyCite* has made it possible to (a) gauge Malaysian publication performance (b) motivate Malaysian journal publishers to contribute and request for indexing of their journals in order to improve the availability and the visibility; (c) contribute to enriching national research content; (d) provide better knowledge of Malaysian's research outputs funded by universities and research institutions; and (e) improve access of information to end-users. *MyCite* empowers the scholarly community of users and can support utility at the national level. This would provide access to published Malaysian scholarly works and should trigger collaboration and citations.

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RELIGION AND BUSINESS FLAGSHIP PROJECT

By: Dr. Lee Kam Hing

The project 'Religion and Business' is a University of Malaya Flagship Project under the Social and Behavioral Sciences Research Cluster. The project is aimed at understanding the dynamics of religion, business, and identity formation in multi-ethnic Southeast Asia. There is an urgent need to anticipate the direction that these religious and economic forces are taking. The interlocking relationships of religion and business, within a setting of growing globalisation and secularisation, are believed to have strongly impacted both state and society in Southeast Asia. They affect the engagements among groups within countries and between those in Southeast Asia and the wider world.

An international conference with the theme 'Religion, Business, and Contestation' was organised in June 2012 in collaboration with the Southern Methodist University in Dallas, which offers post-graduate studies in Islam and Christianity. Prof Terence Gomez and Dr Robert Hunt, Director of Global Theological Education of SMU were the co-convenors of the conference.

There were altogether 21 papers presented by participants from Malaysia and overseas. The overseas participants came from the United States, Australia, New Zealand, Singapore, and Indonesia. Six of the papers presented have since been selected for a special journal issue. The editor of a tier-1 ISI-indexed journal has invited Prof Terence Gomez to submit the selected papers from the conference for review. The rest of the articles will be published as a book.

Conference participants observed that religion is not a waning force in economic matters in Southeast Asia. The emergence of religious-based business groups in Southeast Asia has contributed to renewed discussions about the links between religion and entrepreneurship, seen for example in the emergence of Islamic finance and the halal industry.

In other words, it is transforming markets and enterprises world-wide. The extent to which the beliefs of major faiths or religious movements shape entrepreneurial behaviour as well as determine the decision-making process in their business ventures, however, can be questioned. Religious motivations in relation to economic activities are, complex just as religious conceptualizations of the general order of existence and the human place in it are complex.

The Religious world is not exclusive or independent. The religious diversity of Southeast Asia does not create an archipelago of isolated religious lands. On the contrary, an examination of commerce, economic enterprises, and economic structures show that across a plurality of religions there are common understandings of the general order of existence, common orientations within that order, and shared values. And more obviously there are shared economic enterprises and economic structures.

However, the ideas and activities of these communities have also led to social fragmentation and polarization. The emergence of various movements in Southeast Asia is linked with class inequities though they also indicate that there is a cultural dimension in the economic appeal of certain resurgent and new religious movements. While the activities of a few new religious movements have caused religious conflict, others have created awareness about the institutional reforms that are required within main-stream religions and in society, and have endeavored to rectify social injustices by providing welfare services or by exposing discrimination in various forms.

The features of re-vitalized or new religious communities include being a force for positive or progressive change in society involving the promotion of just and equitable development, greater lay leadership, and more openness to equal participation of women as seen particularly in the case of the Global Ikhwan. An assessment of the corporate ventures of this group indicates that intra-religious networks at national and transnational levels have been created and these ties play a crucial role in capital formation and accumulation that is deployed for proselytizing work or more extremist activities. The theologies and activities of new religious groups are in numerous ways reactionary to the point that they serve ultimately to undermine social cohesion. They are also legitimate endeavors that are in keeping with the tradition of democratic societies to respect the right to freedom of religion.

The state's response to the growing global link of between religion and business has varied and has also changed over time. Singapore's state supported conservative institutions in the 1980s but is now having grave concern over the growing expansion and influence of the mega-churches. Not all resurgent and new religious movements in Southeast Asia appear to have developed a political vision for society at large. What is of concern is how they stand in relation to other major religious groups in Southeast Asia. When seen as non-threatening, the non-mainstream movements are left alone, even though their mere existence represents a threat to the mainstream faiths. However, the response of the state to the non-mainstream religious groups has been strong, even draconian when they have emerged as a major political or social threat seen particularly in the case of Malaysia.

The impact of growing transnationalisation of these new movements have been noted including their capacity to forge global religious alliances, international business links, and create new identities across regional, ethnic and religious boundaries. These groups strive to maintain their distinctiveness. While their business enterprises are pursued to complement traditional programs such as education and welfare to expand their influence, they also have distinctiveness that hardly foster social cohesion.

International Conference Religion, Business and Contestations in Southeast Asia (27-28 June 2012)

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UM Power Energy Dedicated Advanced Centre:
Cascaded Multilevel Inverter Based on Transistor-Clamped H-Bridge Power Cell

Introduction

•The proposed cascaded multilevel inverter uses 5-level transistor-clamped H-bridge (TCHB) power cell.

•Two-cell configuration can produce up to 17-level of line voltage, which is sufficient to produce high-quality output.

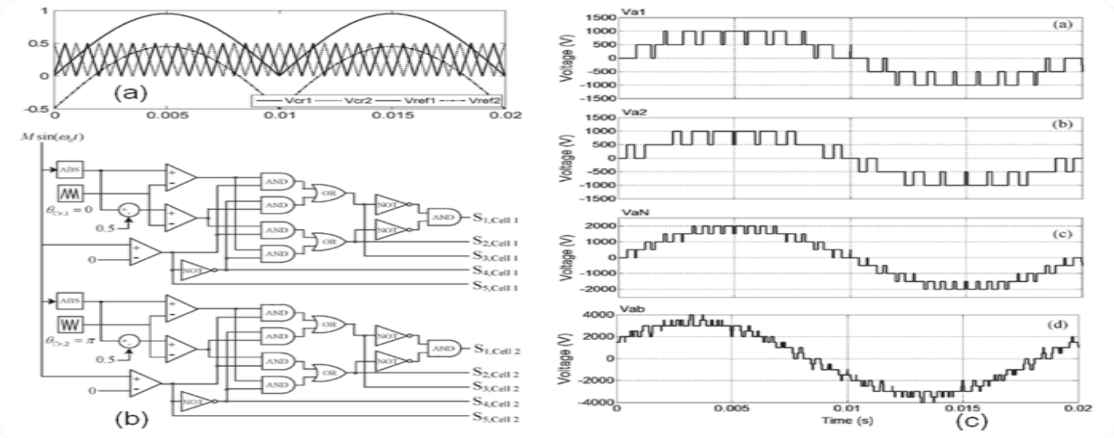
•The switching scheme used is multicarrier phase-shifted pulse-width-modulation.

•The proposed third harmonic offset voltage injection employing hysteresis controller is used to balance the capacitor voltage of the TCHB power cell.

•Total power loss is lower as compared to other conventional cascaded multilevel inverters (i.e. cascaded NPC and 9-level CHB) that produce the same output quality at the same operating voltage owing to lower component counts.

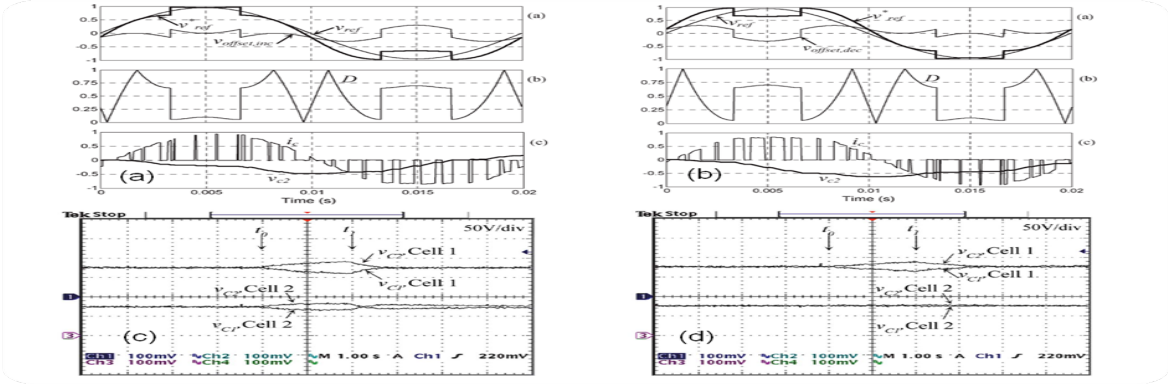
•The proposed inverter is potential for use in medium-voltage applications (e.g. electric drives in heavy industries, ship propulsion, electric train as well as flexible ac transmission system (FACTS) devices - STATCOM, DVR, etc.).

Switching Scheme



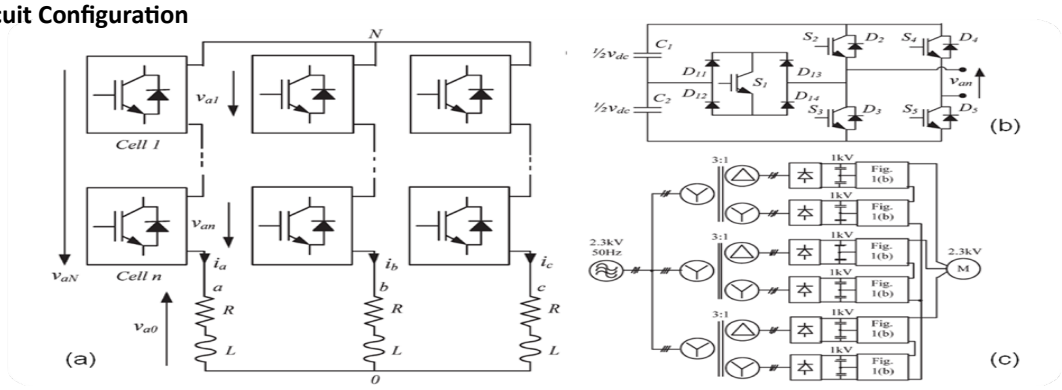
(a) Multicarrier phase-shifted PWM for one phase (b) PWM signal generation (c) Simulated output voltage at medium-voltage level

Capacitor Voltage Balancing



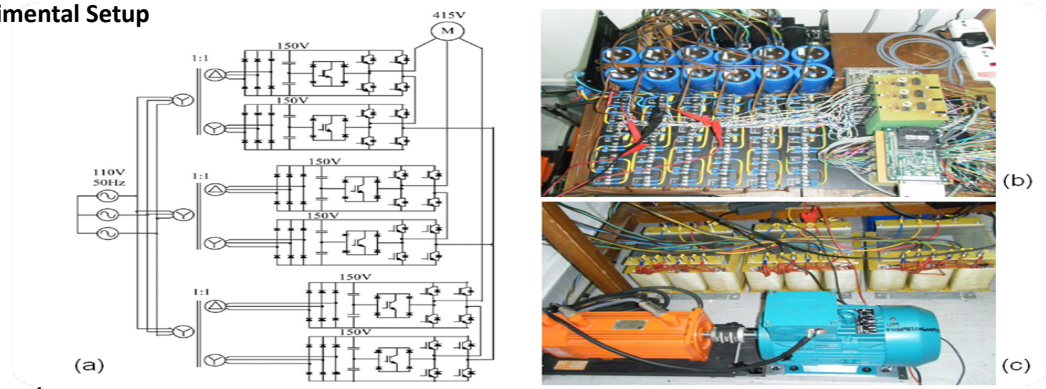
(a) Offset voltage to increase the midpoint capacitor voltage (b) Offset voltage to decrease the midpoint capacitor voltage. Capacitor voltage balancing of (c) Cell 2 disabled (d) Cell 2 enabled.

Circuit Configuration



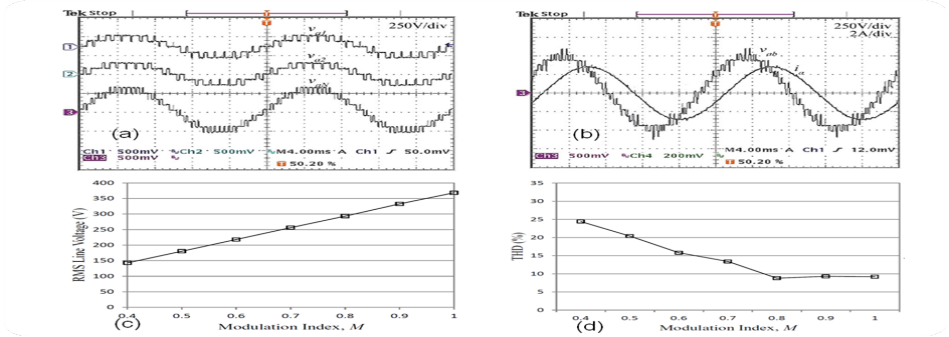
(a) General circuit configuration (b) Five-level TCHB (c) Example of medium-voltage drive application

Experimental Setup



(a) Scaled-down prototype (b) Proposed inverter (c) Induction motor load, servo-brake system and phase-shifting transformers

Experimental Results



(a) Cell voltages and phase voltage (b) Line voltage and current. Inverter characteristics (c) RMS line voltage (d) THD of line voltage

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Institute of Ocean and Earth Sciences:
A Rapid Assessment of the Legal, Institutional and Management Arrangements for Mangroves, Ecotourism and Water Quality at Kota Marudu, Sabah

By: Assoc. Prof. Datin Dr Mary George

Introduction:
The Maritime Law and Policy Research Unit of the Institute of Ocean and Earth Science (IOES), University of Malaya has the opportunity to be involved in a multi-disciplinary/ trans-disciplinary project called "A Rapid Assessment of the Legal, Institutional and Management Arrangements for Mangroves, Ecotourism and Water Quality at Kota Marudu, Sabah." This is a multi and trans-disciplinary project for it involves the study of national laws, scientific and social aspects, and of international laws and across these disciplines.

This project is a tripartite exercise between MOSTI, IOES and an industry-linked partner, Sea Resources Management Sdn Bhd (SRM), to study the national and international laws and policies of the surrounding coastal and marine environments for the sustainable development of mangroves, eco-tourism and water quality at Kota Marudu. It implications on the economy, business and management with additional implications on tourism and eco-tourism studies. The Project's objective is to document the existing legal, institutional and, management arrangements that are in place in Kota Marudu with regard to mangroves, ecotourism and water quality to the best possible level of detail consistency with a rapid assessment approach.

The assessment of the research showed that there was no departure from the planned approach for the project. The study was conducted in four parts as described below:

A: Description of Current Arrangements
•Identify and summarise relevant policy articulation for each area of activity, i.e mangrove management, ecotourism and water quality management.
•Identify and summarise relevant legislation.
•Identify and summarise relevant international law.
•Identify and describe relevant stakeholders, including shared policy actors between the respective areas of interest. This includes the governmental /non-governmental and societal/ cultural institutions and influences.

B: Current Status
•Identify relevant issues.
•Determine critical issues.

C: Evaluation
•Assess current arrangements for consistency and logic, and identify gaps or weaknesses
•Assess adequacy of current arrangements to address identified issues.

D: Recommendations
Formulate key recommendations.

The project objectives were fully realized. Desk-top identification and review of legislation and international law have established the framework within which research and management initiatives must take place. Workshop-based discussions highlighted the deficiencies and opportunities relating to management of mangroves, water quality and ecotourism. It can be said that for the first time, based on the documentation referred to in the objectives, specific recommendations were made on legislative and management interventions to achieve sustainable development outcomes at Kota Marudu.

The project has identified critical issues, problems and expectations of the local population of Kota Marudu with regards to water quality, mangroves and eco-tourism. The project also assessed the current legal, institutional and management framework for these three sectors in Kota Marudu.

The results of the project will therefore be helpful for decision-makers to sustainably develop Kota Marudu. The main benefits of the project have been the acquisition of data. The project identified critical legal issues and problems faced in Kota Marudu with regard to water quality, mangroves and eco-tourism. Having sorted these out, pointers on future directions for eco-tourism were studied. The output of this Project has been documented through a detailed Project Report.

Contribution of the Project to National and International Linkages

Through this Project, SRM Sdn Bhd was introduced to key kampong –level representatives in Kota Marudu and this may assist with future investment facilitation in the areas of coastal and tourism and aquaculture. It was also a pleasure to work smoothly with an industry-linked partner. It augure well for future collaborations.

In conclusion, this Project has resolved critical issues relating to mangroves and water quality at Kota Marudu, improved clarity and focus for differentiated eco-tourism development there through identification of its natural strengths, and enabled the residents to overcome competitive disadvantages so that good outcomes flow for the residents of Kota Marudu.

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The Centre for Tropical Infectious Diseases Research & Education Centre: Towards implementing Safe Science: The Biosafety and Biosecurity Training Programs at TIDREC

The Tropical Infectious Diseases Research & Education Centre (TIDREC) is a dedicated one-stop research centre for the advancement of knowledge in tropical infectious diseases. It recognizes the best practices in conducting research, particularly those involving virulent pathogens and the necessity for proper implementation of biosafety and biosecurity guidelines. TIDREC is the first research centre in the country to install a fully certified biosafety level (BSL) 2 & 3 laboratories at the Faculty of Medicine, University of Malaya. Understanding the importance of biosafety in research, TIDREC has taken up the initiative to promote safe science by actively organizing seminars and training programs to disseminate knowledge in biosafety and biosecurity among researchers and students.

Training courses on biosafety and biosecurity at TIDREC are conducted in collaboration with the Rollins School of Public Health, Emory University and the Behavioral-Based Improvement Solutions, LLC. The approach used in these training courses is from a behavioural management perspective which targets to inculcate good biosafety practices by understanding the risks and benefits associated with a specific laboratory biosafety behaviour. The trainings are conducted in TIDREC's mock BSL-3 training facility at Wisma R&D, University of Malaya.

As to date, TIDREC has organized a BSL-2 and BSL-3 training courses in 2011 and a biosafety leadership and BSL-3 course in 2013. We have trained close to one hundred participants consisting of principal investigators and researchers, administrators and policy makers from several universities, government bodies and private institutions. Through these training programs and our other research related activities, TIDREC aspires to be the reference centre for education and training on biosafety and biosecurity in the region.

BSL-2 and BSL-3 laboratories

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Research Publications based on ISI Web of Science Database from 2004 - 2013

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013*
Number of Publications	388	422	399	499	595	1,091	1,643	2,133	2,155	1,714

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013*
Number of Times Cited	6,017	3,654	4,238	5,153	4,603	6,980	7,927	6,924	3,233	497

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013*
Citations / Publication	15.51	8.66	10.62	10.33	7.74	6.40	4.82	3.25	1.50	0.29

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013*
h-index	34	26	31	33	31	32	32	27	15	6

Research Publications based on Scopus from 2004 - 2013

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013*
Number of Publications	457	548	611	695	955	1,364	1,894	2,507	2,679	2,274

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013*
Number of Times Cited	6,844	4,757	5,484	6,504	6,009	8,597	9,992	9,314	4,676	963

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013*
Citations / Publication	14.98	8.68	8.98	9.36	6.29	6.30	5.28	3.72	1.75	0.42

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013*
h-index	38	31	33	36	32	32	36	31	17	8

*** data compiled as of 31 Oct 2013**

Source- UM Library

UM Publications indexed in WoS according to PTj – as of 31st Oct 2013

AUTHOR(S) WITH UM AS AFFILIATION	NO. OF ARTICLES	TOTAL (1714)
FACULTY OF SCIENCE	612	31.68%
FACULTY OF ENGINEERING	459	23.76%
FACULTY OF MEDICINE	451	23.34%
FACULTY OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY	60	3.11%
PHOTONIC RESEARCH CENTRE	56	2.90%
POWER ENERGY DEDICATED ADVANCED CENTRE (UMPEDAC)	40	2.07%
FACULTY OF ECONOMICS & ADMINISTRATION	36	1.86%
FACULTY OF DENTISTRY	34	1.76%
INSTITUTE OF OCEAN & EARTH SCIENCES (IOES)	27	1.40%
CENTRE FOR RESEARCH IN NANOTECHNOLOGY & CATALYSIS (NANOCAT)	25	1.29%
CENTRE FOR FOUNDATION STUDIES IN SCIENCE	22	1.14%
FACULTY OF ARTS & SOCIAL SCIENCES	21	1.09%
INSTITUTE OF GRADUATE STUDIES	13	0.67%
FACULTY OF LANGUAGES & LINGUISTICS	11	0.57%
FACULTY OF EDUCATION	10	0.52%
SPORTS CENTRE	7	0.36%
NATIONAL ANTARCTICA RESEARCH CENTRE (NARC)	6	0.31%
ASIA-EUROPE INSTITUTE	5	0.26%
FACULTY OF BUSINESS & ACCOUNTANCY	5	0.26%
FACULTY OF THE BUILT ENVIRONMENT	5	0.26%
INSTITUTE OF EDUCATIONAL LEADERSHIP	5	0.26%
ACADEMY OF ISLAMIC STUDIES	4	0.21%
CENTRE FOR MALAYSIAN INDIGENOUS STUDIES (CMIS)	4	0.21%
RESEARCH FELLOW	4	0.21%
FACULTY OF LAW	3	0.16%
INSTITUTE OF CHINA STUDIES	2	0.10%
UNIT ENHANCEMENT ACAD PERFORMANCE (ULPA)	2	0.10%
CENTRE FOR CIVILISATIONAL DIALOGUE	2	0.10%
LIBRARY	1	0.05%
ACADEMY OF MALAY STUDIES	0	0.00%
CULTURAL CENTRE	0	0.00%
INPUMA	0	0.00%
SKET	0	0.00%
Total	1932	100.00%
* Publications refer to: journal articles, review articles		
** Total publications : 1714; 218 publications co-authored from more than 1 PTj		

Source- UM Library

GOOGLE SCHOLAR "My Citations"

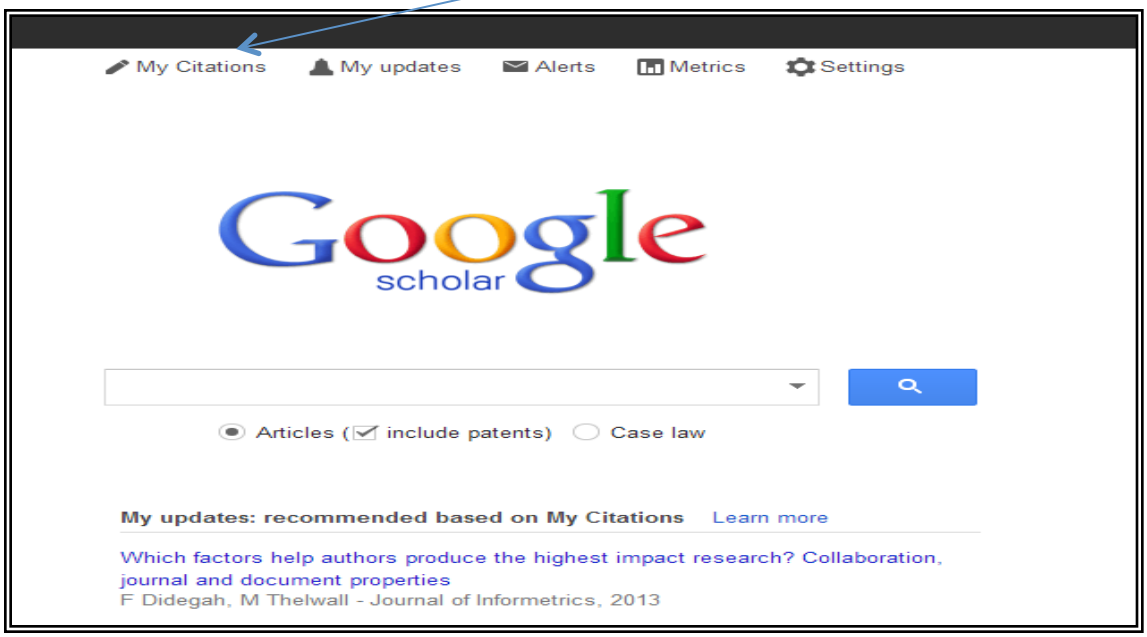
By: Janaki Sinnasamy, Koh Ai Peng

Google Scholar provides an easy way for authors to increase visibility of their articles. It includes scholarly articles from a wide variety of sources in all fields of research, all languages, all countries and over all time periods. Once setup, the publication list in Google Scholar enables others to view and cite your articles. Papers from your website or blog with or without the link can be uploaded. The list of publications can be presented without necessarily providing the full text. It plays a dual role of enhancing visibility of your publications while protecting you against copyright infringement. Once a profile is made public, it will appear in Google Scholar when people search for your name or publication. The choice to make a profile public or remain private is maintained by the author at the settings. You can choose to have your list of articles updated automatically or manually.

You can also check who is citing your publications as well as explore publications in a broad area of research or specific to your area of interest. It is considered a simple way for authors to keep track of citations to their articles. With the availability of your number of publications and citations, Google Scholar can do a simple calculation of your 'h-index'.

How to access Google Scholar

To sign up for Google Scholar Citations, you will need a g-mail account. Login at http://scholar.google.com/. Then click on "My Citations".



Google Scholar will upload publications with the name. It is important to verify the list to ensure the articles listed belong to the author because there can be other authors with the same or similar name. Uncheck any article which is not yours. An example of an author with the name 'Low Wah Yun' is captured in the next screenshot (*not real case and publication list not filtered by author*). It shows a list of the author's publications with bibliographic details and the number of citations for each publication. The citation indices box displays the number of total citations and h-index.

Google Scholar is free unlike the other 'citation tools' which are usually part of subscribed academic databases. While some have described it as poor and inferior citation data, it is easily manageable and can be used by anyone who has no access to the subscribed databases. It also picks up open access full text available in author's self-postings and institutional repositories. It covers much gray literature and unpublished materials uploaded by the authors themselves. In short, it can be described as a one stop free search engine for scholarly publications.

References

- Badke, W. (2013). Coming back to Google Scholar. Infolit land, Sep/Oct, pp. 65-67.
- http://scholar.google.com

INTRODUCTION TO THE RESEARCH TOOLS MIND MAP

By: Nader Ale Ebrahim

This column will discuss the "Research Tools". In each forthcoming issue of the bulletin the tools will be discussed online in details. The researcher can save plenty of research time by using specific tools for specific purposes. This can facilitate quick progress and early completion of research projects. In author's experience, research students who use these tools are able to complete their literature review in less than 3 months. The general view is extracted from an article entitled "Introduction to the Research Tools' mind map [1] which available online at http://ssrn.com/abstract=2280007.

With the increasing use of information and communications technology (ICT), researchers are able to use tools to find, organise, analyse, and share relevant information. However, there are hundreds of such tools to select from, for various research related uses. The author has collected over 700 tools that can help researchers carry out their research related work efficiently. It is assembled as an interactive Web-based mind map, titled Research Tools (available online at www.mindmeister.com/39583892), which is updated periodically. The "Research Tools" mind map consists of a hierarchical set of nodes. It has four main nodes as explained below.

1. Searching for the literature

Tools under this node would assist researchers in expanding their knowledge and developing a research focus. Find keywords and research materials, evaluate a paper, access databases and compare resources with tools from this node.

2. Writing a paper

Several tools of research writing have been assembled into different categories under this node such as: Desktop search, writing/editing tools, Summarizer and Reference Management. There are also tools to assist you in anti plagiarism compliance.

3. Targeting suitable journals

Sometimes, researchers are not sure about the journal when they should target, to publish their research papers. They would like to evaluate a journal's visibility and credibility before submitting their papers. Researchers can use a range of tools to identify, assess, and select appropriate journals with a view to enhancing their publication profile.

4. Enhancing visibility and impact

Publishing a research paper in a scholarly journal will be necessary but not sufficient for receiving citations in the future. We need to ensure that the paper is visible to the relevant users and authors. There are tools that help in enhancing the visibility and readership of research papers. Effective use of these tools can result in increased citations and, thus, improve the h-index of the author [2, 3].

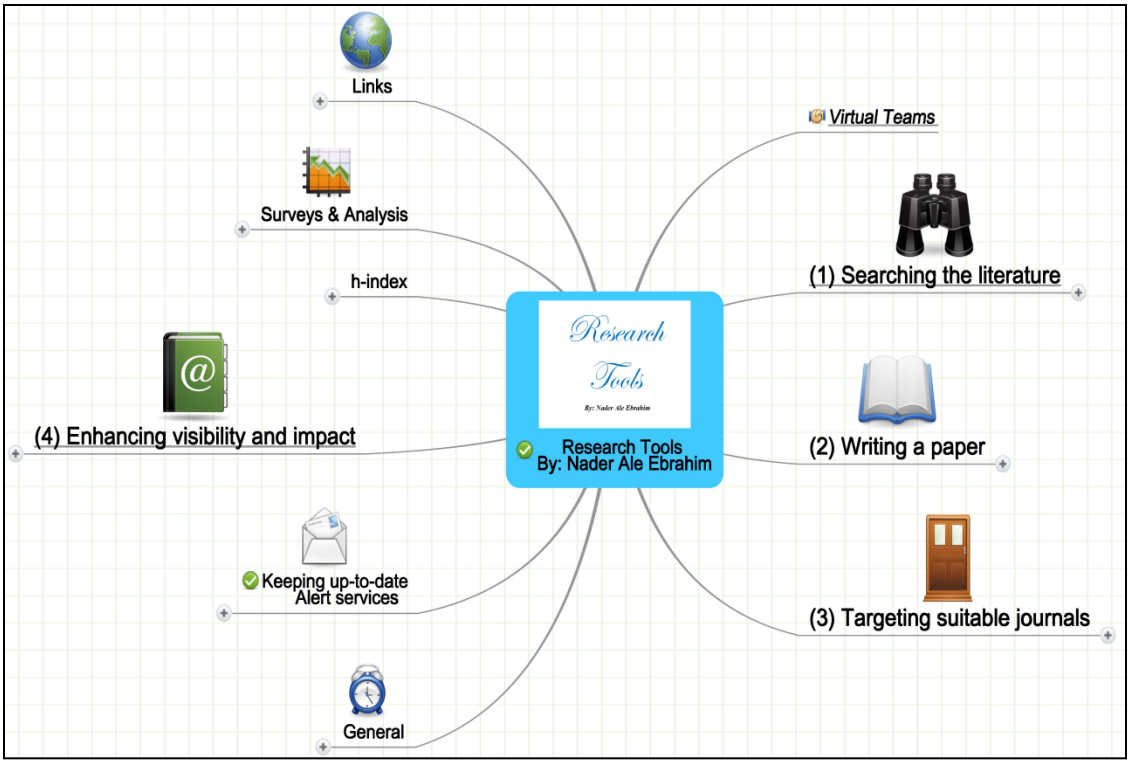
In the mind map, each node has several sub nodes associated with it, which can be accessed by clicking on the plus (+) sign. Several free tools can be found in the sub nodes. Some paid tools are also included. The four main nodes are described below. On the website, a green tick sign in the mind map indicates preference for some tools. Users can access the tools by clicking on the arrow sign that appears next to the tool title.

References

[1] N. Ale Ebrahim, "Introduction to the Research Tools Mind Map," *Research World,* vol. 10, pp. 1-3, June 14 2013.

[2] A. Aghaei Chadegani, H. Salehi, M. M. Yunus, H. Farhadi, M. Fooladi, M. Farhadi*, et al.*, "A Comparison between Two Main Academic Literature Collections: Web of Science and Scopus Databases," *Asian Social Science,* vol. 9, pp. 18-26, April 27 2013.

[3] N. Ale Ebrahim, H. Salehi, M. A. Embi, F. Habibi Tanha, H. Gholizadeh, S. M. Motahar*, et al.*, "Effective Strategies for Increasing Citation Frequency," *International Education Studies,* vol. 6, pp. 93-99, October 23 2013.

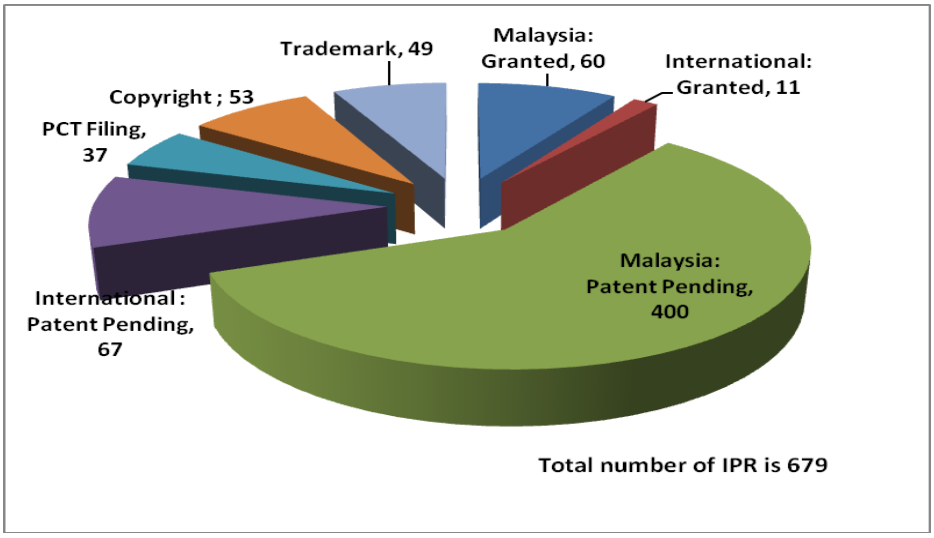


Research Tools Mind Map available at
http://www.mindmeister.com/39583892/research-tools-by-nader-ale-ebrahim

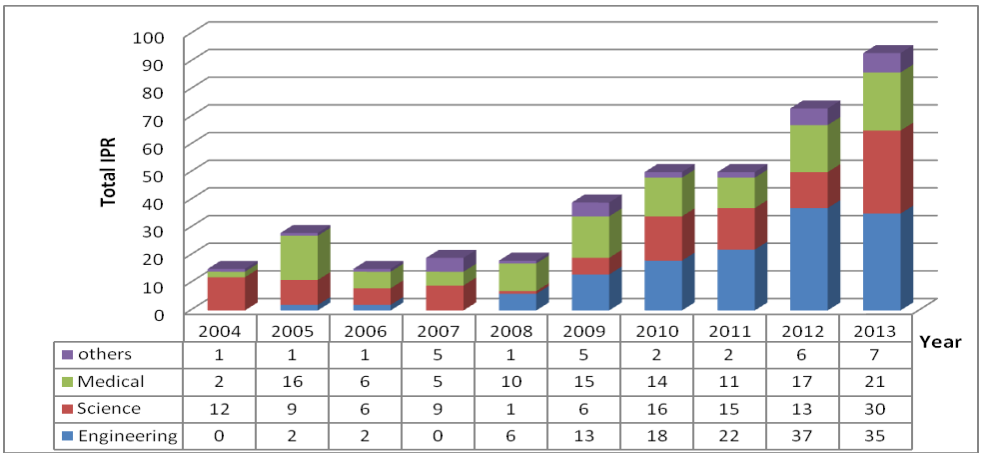
UM CENTRE OF INNOVATION & COMERCIALIZATION: INTELLECTUAL PROPERTY RIGHTS AND APPLICATION PROCESSES

UMCIC (UM Centre of Innovation and Commercialization) is playing a very important role in managing and maintaining the intellectual properties that has been generated by the University of Malaya's inventors, researchers, academicians and entrepreneurs. This is being carried out through the **Intellectual Property Management Unit** which is consistently maintaining and performing their tasks by executing their responsibilities in protecting the intellectual assets and manages intellectual property generated by the university. Besides this, they also could arrange for the legal advice to the inventors concerning contracts and IP filing. There are few types of Intellectual Property protections such as patent, trademark, industrial design, geographical indication, copyright and layout design. We are glad to share the types and the figures of intellectual properties that have been generated in UM as well as the flowchart of the IP application process at UMCIC.

STATUS OF IPR MANAGED BY UMCIC SINCE 2001 (as of November 2013)



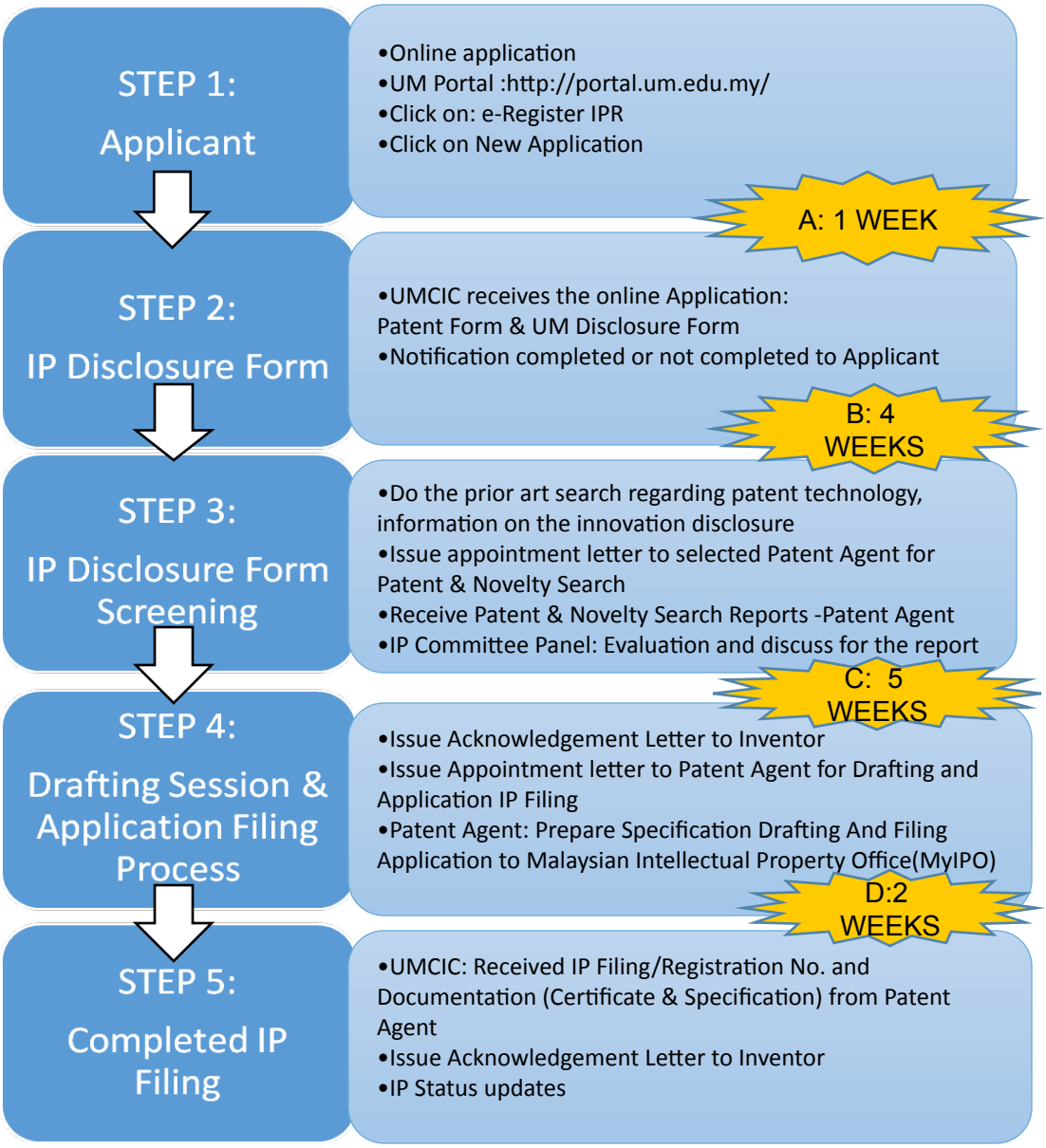
IP APPLICATION BY UM FACULTY SINCE 2001 (as of November 2013)



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
others	1	1	1	5	1	5	2	2	6	7
Medical	2	16	6	5	10	15	14	11	17	21
Science	12	9	6	9	1	6	16	15	13	30
Engineering	0	2	2	0	6	13	18	22	37	35

Note: Others include FSKTM, Education, Alam Bina, and Sport

FLOWCHART OF IP APPLICATION PROCESS AT UMCIC



NOTE: PROCESS STEP 2 - 5 = 12 WEEKS

IPPP RESEARCH LAB FACILITIES

NO	FACILITIES	MODEL	RATE (RM)			
			UM User		Non-UM User	
1	Nuclear Magnetic Resonance (NMR)	Jeol Jnm-gsx 270	30.00		60.00	
2	SEM (Sample Preparation)		30.00 (Material sample) 50.00 (Biological Sample)		60.00 (Material sample) 100.00 (Biological Sample)	
3	GCMS	Agilent Technologies	25.00/sample 500.00/year*		50.00/sample	
4	Confocal Laser Microscope	Leica Tcs Sp5 Ii	60.00/hour 500.00/year*		100.00/hour	
5	Field Emission Scanning Electron Microscope (FESEM)	Quanta FEG 450, EDX-OXFORD	**High/ Low Vacuum**	**ESEM/WetStem**	**High/ Low Vacuum**	**ESEM/WetStem**
			180.00/sample (max 7 images) additional image RM20 each	250.00/sample (max 7 images) additional image RM20 each	360.00/sample (max 7 images) additional image RM40 each	500.00/sample (max 7 images) additional image RM40 each
			EDX	**EDX**	**EDX**	**EDX**
			Elemental: 100.00/sample (max 7 spot/ area) additional spot/area RM10 each	Elemental: 100.00/sample (max 7 spot/ area) additional spot/area RM10 each	Elemental: 200.00/sample (max 7 spot/ area) additional spot/area RM20 each	Elemental: 200.00/ sample (max 7 spot/area) additional spot/ area RM20 each
			Mapping: 100.00/sample (max 3 area) additional area RM10 each	Mapping: 100.00/sample (max 3 area) additional area RM10 each	Mapping: 200.00/sample (max 3 area) additional area RM20 each	Mapping: 200.00/ sample (max 3 area) additional area RM20 each
6	Surface Area Analyzer (BET)	Micromeritics ASAP2020, TRISTAR II 3020 Kr	150.00/sample		300.00/sample	
7	Differential Scanning Calorimeter (DSC)	Perkin Elmer (Dsc-8000)	150.00/sample		300.00/sample	
8	Simultaneous Thermal Analyzer (STA)	Perkin Elmer (Sta 6000)	150.00/sample		300.00/sample	
9	Particle Image Velocimetry (PIV)	Dantec Dynamics Nano L135-15piv	From 50.00/experiment (Depend on experiment requirement)		From 100.00/experiment (Depend on experiment requirement)	
10	DNA Sequencer	Applied Biosystems (3730xl DNA Analyzer)	12.00/reaction		24.00/reaction	
11	Real Time PCR	Applied Biosystems Quantstudio (12k Flex Real Time PCR System)	30.00/hour		60.00/hour	
12	Dynamic Mechanical Analyzer	Perkin Elmer	100.00/sample		200.00/sample	

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